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COMMERCIAL FISHES REVIEW



VOL. 27, NO. 1

JANUARY 1965

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Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

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COVER: Shows Bering Sea catch of a Japanese trawler. The catch consists mostly of Alaska pollock and arrowtooth flounder (also known as turbot). A few tanner crab can be seen in lower right hand corner. A total of 14 Japanese bottomfish fleets (2 fish meal fleets and 12 freezer fleets) operated in the Bering Sea in 1964 and caught over 400,000 metric tons of bottomfish, surpassing the 1963 catch by about 100,000 tons. Only about 2,000 tons of halibut and 6,000 tons of sablefish were reported in the 1964 catch which consisted mainly of Alaska pollock, rockfish, flatfish, and herring. Japanese bottomfish operations in the Bering Sea expanded rapidly in 1960 and reached a peak in 1961 when 33 fleets reported a combined catch of over 600,000 tons. Since 1961, fewer Japanese fishing fleets have gone to the Bering Sea, but the size of Japanese catcher vessels in the Bering Sea has increased. Japanese larger stern trawlers (serving as fishing vessels and motherships) made their first appearance in the Bering Sea in 1964.

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SALMON TRAVEL

All Atlantic salmon tagged in the Narraguagus River, Maine, by the Maine Atlantic Salmon Commission, that have been recovered outside the river, have been taken in ocean waters and not in other salmon rivers. According to a biologist, several have been recovered in commercial nets in the ocean from the vicinity of Nova Scotia (170 miles), Newfoundland (760 miles), and as far north as 30 miles above the Arctic Circle on the west coast of Greenland.



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REVIEW OF INDUSTRIAL BOTTOMFISH FISHERY IN NORTHERN GULF OF MEXICO, 1959-62

By Charles M. Roithmayr*

BACKGROUND

The problem of unwanted fish caught in commercial harvests is not new to the United States fishing industry. An effort to find a solution resulted in a report published in 1907 by the U. S. Bureau of Fisheries. The only practical suggestion offered at that time was to develop the utilization of those species having no market.

In 1952, the Gulf coast fishing industry attempted to solve the problem of marketing small bottomfish, weighing less than 1 pound each and caught incidentally in shrimp trawls, by constructing a petfood plant at Pascagoula, Miss.

Production of such fish gradually increased each year thereafter, and by 1958 ten plants at 6 ports located in Mississippi and Louisiana processed approximately 41,000 tons (fig. 1). Additional use of fish was made at that time by the poultry industry in the form of fish meal, and by the fur-farming industry (especially for the feeding of mink). Production decreased slightly in 1960 and 1961, but increased again in 1962 to a record catch of 48,000 tons valued at \$1.6 million ex-vessel. Of the total catch processed, 85 percent was canned as petfood, while the remainder was frozen for mink food and crab bait, and dehydrated into fish meal. Mississippi led all states, accounting in 1962 for 40 percent of the total United States petfood pack with a value of \$14.9 million to the Mississippi canners. The total United States pack of animal food from fishery products in 1962 amounted to 7.8 million cases--more than twice the salmon pack and more than one-half of the tuna pack for human consumption.

In 1958, the Gulf States Marine Fisheries Commission recommended that funds be made available to make a study of the industrial fishery of the northern Gulf of Mexico. Later that year the Fish and Wildlife Service assigned biologists to survey the species and size composition of landings made by the bottomfish fleet at Pascagoula, Miss. The principal objectives of the study are to detect changes that may occur in the fish populations, and to obtain life history information for the major species. The present report deals with some of the results obtained from 1959 through 1962.

* Fishery Biologist, U. S. Bureau of Commercial Fisheries, Pascagoula, Miss.

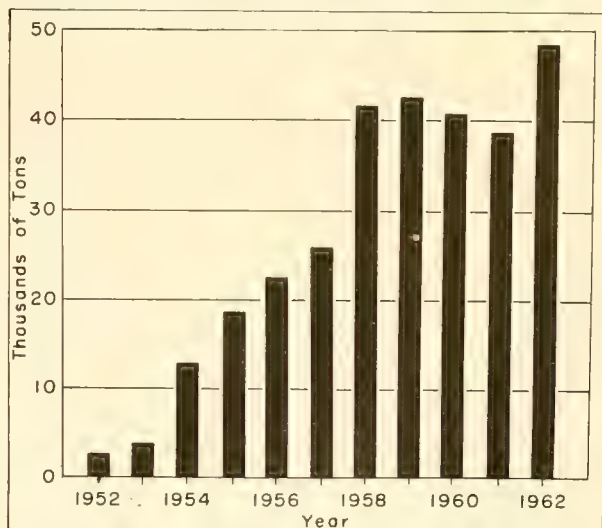


Fig. 1 - Industrial bottomfish landings of the northern Gulf of Mexico.

PRESENT FISHERY

Fishing for bottomfish is presently conducted over the inner Continental Shelf near the Mississippi River Delta (fig. 2). A resident fleet of approximately 50 trawlers generally seek

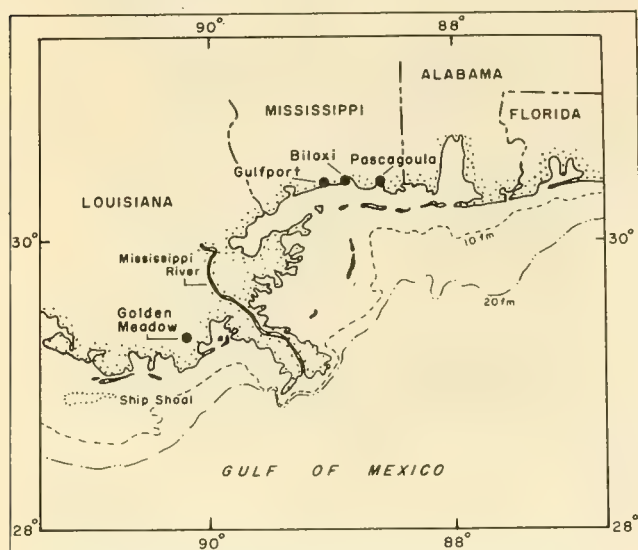


Fig. 2 - Ports of landing and fishing grounds in the industrial bottomfish fishery.

fish in 4 to 20 fathoms from Ship Shoal, Louisiana, to the southeast coast of Alabama; and land their catches at Golden Meadow, La., as well as in Gulfport, Biloxi, and Pascagoula, Miss. Within that area, the 10-fathom curve averages about 10 miles from shore. The sea bottom consists largely of mud and sand, and is generally level, providing excellent trawling conditions.

The shallow waters of the northern Gulf are characterized by an abundant variety of fish. Sixty-five families of fish, including over 170 species, have been identified in the commercial bottomfish landings.

Four members of the Sciaenidae, or drum family, contributed significantly to the overall production (fig. 3). On the average, croaker, spot, sand sea trout, and silver sea trout accounted for 72 percent

of the annual landings during the 4-year period. The croaker was by far the most important species harvested each year, averaging 53 percent of the total catch, and ranged from 19,000 tons in 1959 to 28,000 tons in 1962. By com-

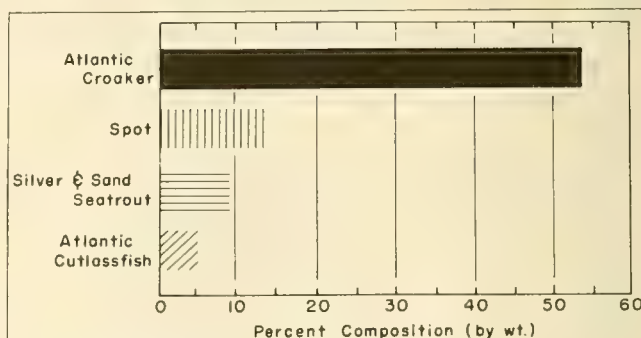


Fig. 3 - Relative production of principal species, 1959-62, in the industrial bottomfish fishery of the northern Gulf of Mexico.

parison, the maximum commercial production of croaker in Virginia and North Carolina, where it was a principal foodfish, was 30,000 tons in 1945.

The croaker of the Gulf was largely responsible for the marked increase in the bottomfish landings in 1962. The 4 members of the drum family were present in the trawl catches throughout the year, while the cutlassfish, or silvereel, made seasonal contributions to summer and fall catches. The croaker was equally abundant in catches from all grounds with the exception of the nearshore area in 1 to 7 fathoms east of the Delta, where reduced abundance may have been due to the presence of large amounts and a great variety of other species. The spot was approximately two times more abundant east of the Delta, while both species of sea trout were 2 to 3 times more abundant west of the Delta. The cutlassfish was more plentiful in catches from the nearshore grounds east and west of the Delta.

A major portion of the life history project involves the separation of age groups, or year-classes, of each of the four major species contributing to the fishery, the purpose being to expose any variation in relative abundance of successive age groups, and to determine what effect it has on the commercial catch. One to 8 life history samples were obtained each week from commercial catches landed at Pascagoula, Biloxi, and Gulfport, Miss., since July 1961. One hundred fish per sample were measured for total length. Subsampling every fifth fish provided scales for age studies, weight measurements, sex, and stage of sexual maturity.

ANALYSIS OF LENGTH AND WEIGHT DISTRIBUTIONS FOR CROAKER

The findings reported in the following discussion are restricted to the croaker. Attempts to use the scale method of age determination have had limited success since annuli, or year marks, are difficult to determine. Therefore, analysis of length and weight distributions, despite acknowledged subjectivity, has had to be relied on for age determination. The results reported in this study are to be considered preliminary. Samples of croaker were available from the inshore estuaries and sounds, as well as from the nearshore areas in the Gulf in abundant quantities for the first time in October 1963. The inshore material was obtained from collections made in Mobile Bay and Mississippi Sound by personnel of the Alabama Marine Resources Laboratory.

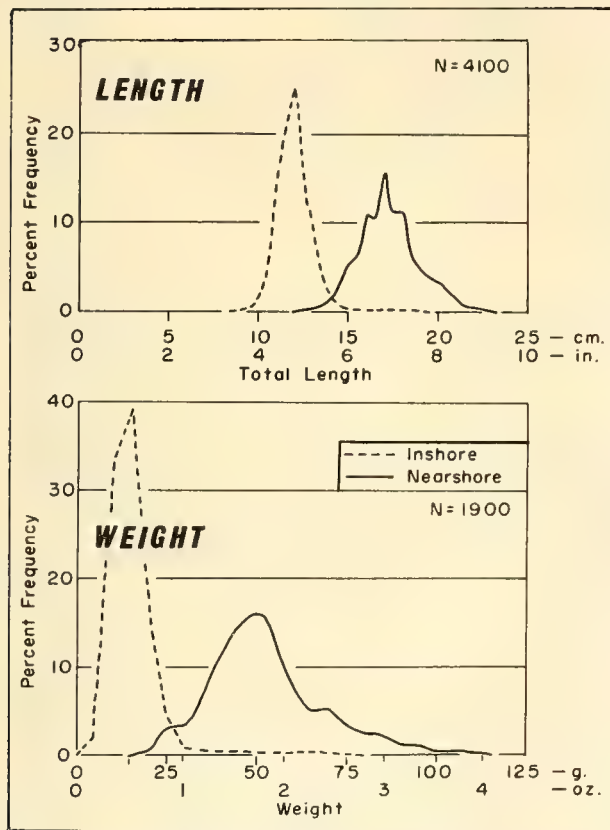


Fig. 4 - Frequency distributions--Atlantic croaker, east of the Delta, October 1963.

Length measurements of 4,100 fish clearly show the presence of two size groups from east of the Mississippi River Delta between Chandeleur Island and Mobile Bay (fig. 4). The average length of fish caught inshore in Mobile Bay and Mississippi Sound was 12 centimeters (almost 5 inches). Fish captured nearshore in 2 to 7 fathoms in the Gulf averaged 17 centimeters (nearly 7 inches).

A similar separation of croaker into two size groups was evident by using the weight determinations of 1,500 fish. The average weight of inshore fish was 15 grams, or about one-half ounce, while nearshore fish in the Gulf averaged 50 grams, or nearly 2 ounces.

Associated data on sexual maturity of those fish showed that 97 percent of the inshore fish examined were virgin, and the remainder were in spawning condition, or had recently

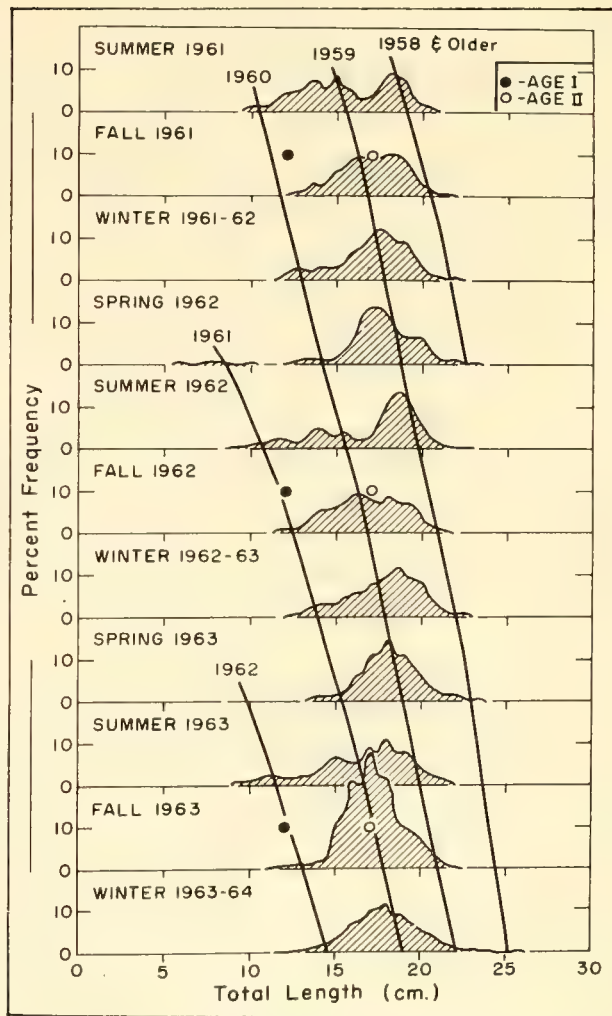


Fig. 5 - Length frequency distribution--Atlantic croaker in the industrial bottomfish fishery of the northern Gulf of Mexico.

spawned. On the other hand, no virgin fish were evident in nearshore samples from the Gulf, while 43 percent were either ripening or ripe.

Previous studies of croaker east of the Delta since 1961 showed that quantities of ripe fish were present from 3 to 7 fathoms in the Gulf from September through November. Assuming that to be the principal spawning period, it is hypothesized that the smaller size group of 5-inch fish present in the inshore waters during October 1963 was spawned in fall 1962, and may be identified as the 1962 year-class. Larger fish, which average 7 inches in length, are 1 year older, constitute the 1961 year-class, and are spawning for the first time. It is tentatively concluded, therefore, that those are largely 1- and 2-year-old fish. The croaker on the Atlantic coast reaches a length of 7 inches at the end of the first year, which indicates a somewhat higher (average) growth rate than for croaker in the Gulf.

The unweighted samples, grouped by 3-month periods, illustrate in a general way how year-classes contribute to the commercial fishery (fig. 5). In fall 1961, spawning of fish 2 years old and older produced the 1961 year-class. In spring 1962, juvenile fish less than 1 year old first appeared in Gulf catches near the estuaries. During the fall of 1962, fish at age I were largely unavailable. Not until summer 1963 did that year-class contribute appreciably to the catch. By fall 1963, when spawning occurred for the first time at age II, it supplied the major tonnage to the fishery.

A similar sequence of events is observed for the 1960 year-class. Small quantities of 1-year-old fish were present in late 1961 and early 1962 catches. A gradual increase began in summer, and by fall 1962, at 2 years of age, they contributed most of the catch. They continued to provide the bulk of the catch until summer 1963, but were largely absent from the industrial bottomfish fishery by fall at age III.

Fish presumably 3 years old were present in November 1961 samples collected from exploratory tows in 30 to 40 fathoms off the Mississippi River Delta by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel *Oregon*. They measured an average of 21 centimeters (8 inches) and weighed about 3 ounces. Commercial gill nets operating inshore near Gulf Shores, Ala., during October 1963 yielded fish averaging 30 centimeters (12 inches), weighing 1 pound. It is estimated that those fish are between 5 and 7 years of age.

FISHING AND CATCH DATA

To measure changes in the relative abundance of bottomfish, it is important to have complete and detailed records of catch from year to year. Such information is being obtained from the records of individual vessel landings kept by the processing plants. In addition, we must obtain not only information as to the amount of fish caught, but also information regarding

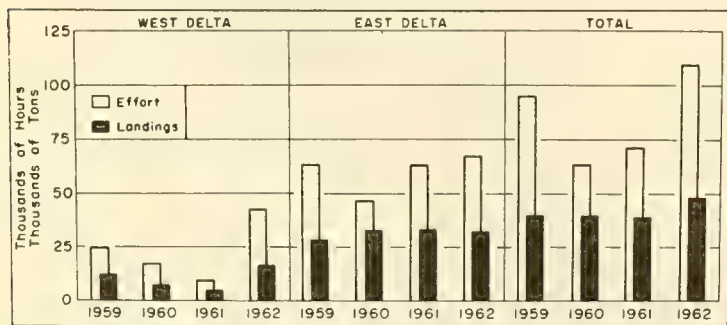


Fig. 6 - Effort and catch statistics in the industrial bottomfish fishery of the northern Gulf of Mexico.

their location, and the time required to capture them. Those data are being collected by means of personal interviews, and from logbooks being kept by vessel captains.

Annual landings varied only slightly from an average of approximately 40,000 tons during the period 1959-1961, but increased to 48,000 tons in 1962 (fig. 6). Landings originating east of the Mississippi River Delta remained comparatively level during the 4-year period, averaging 31,000 tons, or 76 percent of the overall total. On the other hand, landings from

west of the Delta declined by more than one-half between 1959 and 1961, but increased three-fold in 1962. Comparative effort data show that the increase in total landings in 1962 was the result of the increased effort expended by the fleet on west Delta grounds.

On the average, fishing from December through May occurred between Point au Fer, La., and Southwest Pass, La.; and from Pass a Loutre, La., to Perdido Bay entrance, Fla.; and off-

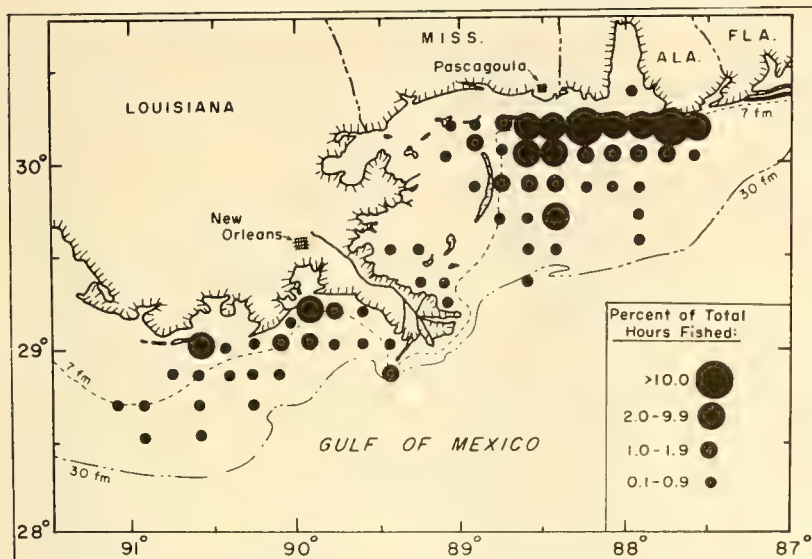


Fig. 7 - Distribution of fishing effort in the industrial bottomfish fishery, December-May 1959-62.

of the barrier island beaches, and east of Mobile Bay entrance. On the average, intensive fishing in that area accounted for 40 percent of the total effort expended in the north-central Gulf between June and November.

Part A of figure 9 compares the average relative abundance for all bottomfish species, and for croaker, in tons per hour, from 1959 through 1962. Minimum values for all species and for croaker are evident in March. A twofold increase takes place by June followed by a decreasing trend through November, and increasing again in December. Obviously the croaker governs the seasonal variation in the overall relative abundance of the bottomfish resource.

Part B of figure 9 reveals that the average depth fished by trawlers in February is 12 fathoms, while shallower depths of 5 to 6 fathoms are fished from June through October.

In Part C of figure 9 it is evident that the average tow takes 2½ hours in March, while shorter tows of about 1½ hours each are made in June, July, and August. Most apparent from those data is that the evident change in bottomfish abundance from spring to summer is largely due to a real increase in the croaker yield on the nearshore grounds.

shore to a depth range of 20 to 30 fathoms (fig. 7). The grounds most heavily fished each year were in 8 to 12 fathoms off Chandeleur Island, Horn Island, and Petit Bois Island; in 5 to 12 fathoms east of Mobile Bay entrance; and in 8 to 12 fathoms off Timbalier Bay, La. Seventy percent of the total effort was expended in the area east of the Delta from December through May.

Fishing from June through November was generally limited to the nearshore grounds between Ship Shoal and Southwest Pass, La.; and between the Chandeleur Islands and the entrance to Perdido Bay (fig. 8). East of the Delta, the amount of seasonal effort increased markedly nearshore, particularly within 5 miles

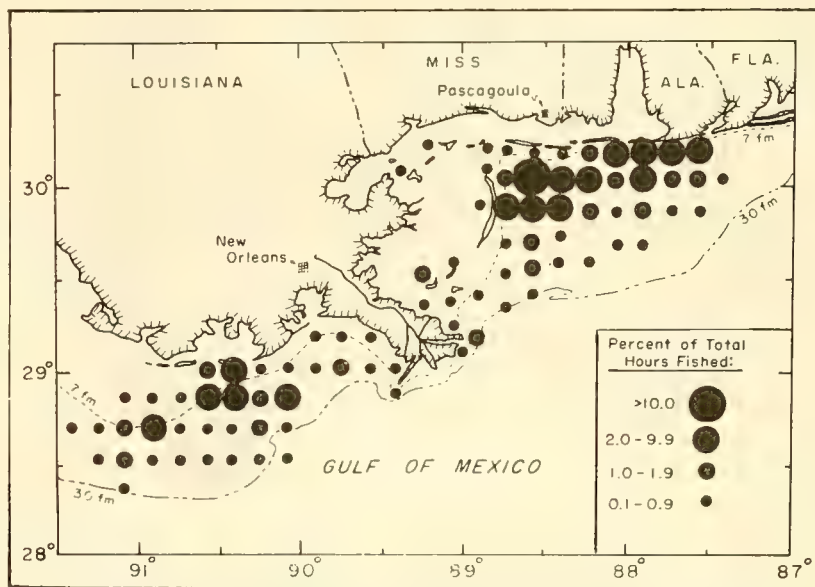


Fig. 8 - Distribution of fishing effort in the industrial bottomfish fishery, June-November 1959-62.

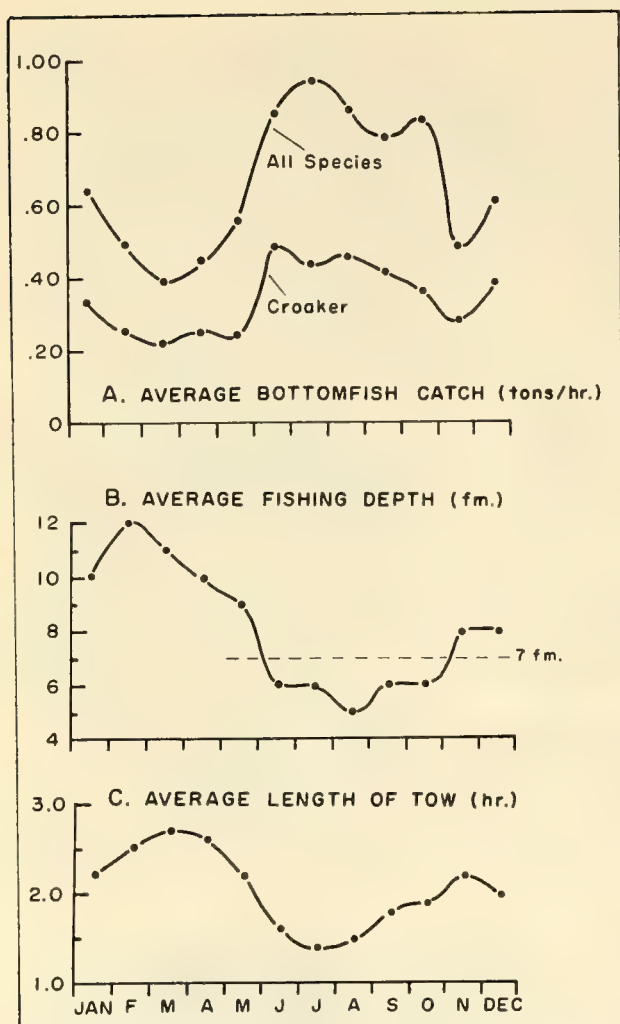


Fig. 9 - Catch and effort statistics, 1959-62, in the industrial bottomfish fishery.

GENERAL OBSERVATIONS ON CROAKER

More than one factor is believed to cause the seasonal increase in the yield of croaker. Analyses show that the average weight was consistently less in summer than in spring, whereas the average number of fish in each standard-weight sample was greater in summer. It is believed that yearling fish become available to the fishery in substantial amounts for the first time after leaving the estuaries. Weight determinations also showed that the average weight of age group II, which is the dominant group in the catches, increased 21 percent from spring to summer. These observations indicate that the increased summer yield of croaker may result from recruitment of 1-year-old fish into the fishery, together with a substantial weight increase of 2-year-old fish. Further investigation is being made concerning this matter.

Gross analysis of monthly catch and effort statistics for the Gulf bottomfish fishery has been completed for the period 1959 through 1962. The mean relative abundance of bottomfish, using catch per hour as an index, was almost identical for both the east and west Delta grounds. Since effort expended in west Delta waters averaged only 25 percent of the overall northern Gulf total, additional exploitation there is indicated. Another finding is that the abundance of bottomfish on the heavily fished grounds of the east Delta area remained almost the same, whereas the overall trend in catch increased measurably during the 4-year period. Continued study of the fishery will reveal whether or not increasing catches have begun to harm this resource potential.

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Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

SUMMARY OF TUNA OBSERVATIONS IN THE GULF OF MEXICO ON CRUISES OF THE EXPLORATORY FISHING VESSEL OREGON, 1950-63

By Tomio Iwamoto*

ABSTRACT

A resume of work done on tuna by the exploratory fishing vessel Oregon during 14 years of exploratory fishing in the Gulf of Mexico is given. Prospects for commercial exploitation of tuna in the Gulf are discussed. Surface observations of tuna logged on the Oregon are summarized. Blackfin and skipjack tuna are the tuna most frequently found at the surface in the Gulf; their abundance indicates a commercial potential.

INTRODUCTION

Because of the increasing world demand for tuna, a few restricted populations of that fish have become subjected to tremendous fishing pressures which may exceed the limits for a maximum sustainable yield. In the case of the yellowfin tuna in the tropical eastern Pacific, efforts already are being made to limit the size of the catch on an international basis. It becomes evident that other stocks of tuna must be found and harvested to distribute fishing pressures and to satisfy future commercial and conservation needs.

The Gulf of Mexico has long been a source of wealth in terms of shrimp, snapper, menhaden, oyster, and many other marine products. Explorations by the U. S. Bureau of Commercial Fisheries research vessel Oregon indicate the existence of potentially commercial stocks of offshore tuna in the Gulf.

The potential for a long-line fishery in the Gulf of Mexico and Caribbean Sea for deep-dwelling yellowfin tuna has already been reported by Bullis and Captiva 1955 and Wathne 1959. Information obtained on the R/V Oregon indicates an excellent potential for exploiting surface-occurring schools of tuna in the Gulf; however, specific data on surface occurrences of tuna in that region have not been published.

The purpose of this report is to summarize the Gulf of Mexico tuna investigations conducted on the Oregon, with emphasis on the occurrence of tuna at the surface.

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Fig. 1 - The U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 723

BACKGROUND

EARLY TUNA SIGHTINGS: In 1950, the Fish and Wildlife Service began an exploratory fishing program in the Gulf of Mexico with the motor vessel Oregon. From the beginning of the program, tuna schools were sighted from the Oregon in large numbers. Scattered reports by merchant vessels and tugs also indicated that sizable populations of tuna were present.



Fig. 2 - A blackfin tuna caught on a trolling jig is hoisted aboard the Oregon. Trolling lines are set out during all daylight running hours.

Occasional troll captures by the Oregon showed the schools to be composed of yellowfin (*Thunnus albacares*), blackfin (*T. atlanticus*), and skipjack tuna (*Katsuwonus pelamis*). During September 1951, Bullis (1955) reported sighting 9 schools of blackfin in 1 day off Mississippi and Louisiana, with the schools averaging an estimated 100-500 tons each. Through the years similar sightings of tuna schools have been made by Oregon personnel. The report for Oregon cruise 24 in the northeast Gulf states: "Observations of surfacing tuna paralleled those made in preceding years during the summer months. Schools of blackfin, yellowfin, and white skipjack, sometimes mixed together, were seen every day during the trip" (Springer 1954).

made from the Oregon with this gear are inconclusive. The weather was highly unfavorable during this time, and the tuna schools were wild and not in a good condition for seining. Purse seining for tuna, other than bluefin, was a relatively new innovation at the time the trials were made, and the revolution resulting from the development of the nylon net and power block that ultimately saw the mass conversion of the California clipper fleet in 1959, 1960, and 1961, was still in the infant stage (McNeely 1961).

Live-Bait: In 1953 an attempt was made at live-bait fishing, a method that was predominant in the tuna fisheries at that time. The Oregon was ideally suited to this method, for it was a tuna clipper specifically designed for the West Coast live-bait tuna fisheries. Results of the live-bait trials were summarily poor. Live bait was plentiful and easily caught in the Gulf (Siebenaler 1953). Surface schools were readily found and could be attracted to the vessel with live-bait chum and spray from the fire hose. The tuna could not,

EARLY FISHING ATTEMPTS:
Purse Seine: A few attempts at purse seining were made during 1952 with linen nets. The results of the few sets

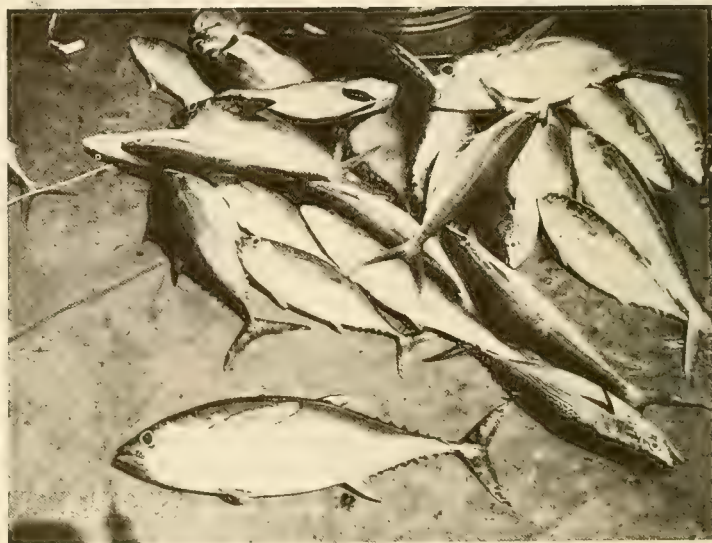


Fig. 3 - A mixed catch by the Oregon of troll-caught blackfin tuna (*Thunnus atlanticus*), little tuna (*Euthynnus alletteratus*) and rainbow runners (*Elagatis bipinnulatus*).

however, be held at the stern of the vessel long enough for satisfactory catches to be made.

Long Lines: Preliminary results of fishing Japanese long lines in early 1954 showed this to be an effective method for harvesting the deeper running tunas, notably the yellowfin tuna (Thunnus albacares). After 1954, fisheries personnel at Pascagoula emphasized the use of long-line fishing.

TUNA LONG-LINE OPERATIONS: Areas of Tuna Concentrations: OFF THE MISSISSIPPI RIVER: During the early exploratory phase of the tuna long-lining program, two areas with notable concentrations of subsurface tuna were discovered. One area was the northern Gulf of Mexico off the Mississippi River delta along the 1,000-fathom curve. Yellowfin were found during every month in that area although they were present in commercial quantities only from July through December. An interesting find was large bluefin tuna (Thunnus thynnus) in the 300- to 700-pound class during March and April. Those large fish caused much damage and loss of gear. Because a market for them did not exist at the time, commercial ventures for the large bluefin were not deemed feasible.

CAMPECHE GULF: Another area was found in the Gulf of Campeche where yellowfin were apparently present in commercial quantities during all seasons. That area extends northward through the middle Gulf and intergrades with the first area. The two areas were fished on a commercial scale with long lines during three cruises of the Oregon in 1955 and 1956. The average catch rates for the three cruises were 5.0, 4.4, and 4.5 yellowfin per 100 hooks, with individual station highs up to 12.9 yellowfin per 100 hooks (Wathne 1959). The yellowfin caught in the Gulf of Mexico averaged over 100 pounds apiece; most of the first were between 60-150 pounds (Bullis 1955).

Commercial Long-Line Ventures: EARLY ATTEMPTS: During the years that the Oregon made tuna long-line investigations, several boats were converted to fish that gear in the Gulf. Catch rates of a few of the vessels indicated a good potential, although the operators were fishing far less gear than they were capable of and were generally disregarding much of the proven methodology recommended by Bureau personnel. Unfortunately, the lack of a suitable local market for tuna made the venture unprofitable because storage of catch and cost of transshipment to Puerto Rican or West Coast canneries proved prohibitive.

PRESENT STATUS: Since 1958, United States fishermen have done very little with Gulf of Mexico tuna. No American vessels are now known to fish tuna commercially in the Gulf. The Japanese are known to have recently made several sizable tuna long-line cruises, possibly on a seasonal basis, in the southwest Gulf. Firm catch figures are not available, but catch rates are rumored to have been high. The Cuban live-bait tuna fishery, operating since 1940, is still believed to be in existence. This fishery is based in the northern section of Cuba and operates quite close to shore. The catch, comprised of small blackfin and skipjack tuna, averaging 3-4 pounds, is canned and consumed domestically (Rawlings 1953).

PRESENT PROSPECTS FOR A GULF TUNA FISHERY

LONG-LINE METHOD: The long line is now the only available commercial gear used for harvesting deep-dwelling tuna (Bureau of Commercial Fisheries 1963). That gear has serious limitations, however, because its manpower requirements are quite high. In a society, such as Japan's, where labor costs are low, the long-line method is economically feasible. The rapid rise in the last decade in Japanese tuna production can be attributed to the use of the long line. The method dominates their tuna fleet to this day. To the United States fisherman, the high cost of labor may make the difference between a commercially feasible venture and an unprofitable one; thus, the use of long lines for tuna remains marginal in this country today. It is now being used to a limited degree in the East Coast tuna fishery where swordfish long liners seasonally switch to tuna to supplement their incomes. The economic problems involved in using that method in the Gulf of Mexico fishery remain unsolved. Under present conditions, other gear fishing surface tuna appear to hold greater promise.

PURSE-SEINE METHOD: Because of economic difficulties due to increased foreign competition and lowered market prices for tuna in the 1950's, the United States tuna industry was forced to look for improved methods to reduce the cost of its operations. The nylon purse seine and the power block proved to be the answer to the industry. This strong and easily handled gear made possible huge catches of entire tuna schools. Single sets of over 20 tons of fish are common in the Eastern Pacific tuna fishery. The substantial increase in fish-per-man-days at sea resulting from the use of the purse seine offset the initial high cost of the conversion to this gear.

The change of the fleet from predominantly bait vessels to primarily purse-seine vessels took place at a rapid pace in the late 1950's, reaching a peak in 1960 (McNeely 1961). Since then, purse seiners have been the paramount producers of tuna in the United States fleet. In 1962, 139 purse seiners were reported operating out of United States ports, including Puerto Rico, compared with 36 bait vessels (Schaefer 1963). Predictions are that bait vessels will have only limited use in the United States tuna fleet unless radical improvements are made toward obtaining greater efficiency. In the foreseeable future the purse-seine vessel will continue to dominate the United States tuna fleet.

SURFACE-SCHOOLING TUNA OFFER BEST COMMERCIAL POTENTIAL: The prospects for harvesting surface-occurring tuna in the Gulf of Mexico with purse seines appear quite favorable. This outlook is based mainly upon the fact that great numbers of large schools of tuna, predominantly of two species, the blackfin tuna and the skipjack, were sighted throughout the Gulf during the Oregon's exploratory fishing. Those two species are often found mixed together in large dense schools and take trolled lures quite readily. The incidences of Oregon troll captures of blackfin are quite small, however, because the trolled hooks are easily torn out of their delicate mouths. Also, the Oregon cruises too fast for trolling to be very effective.

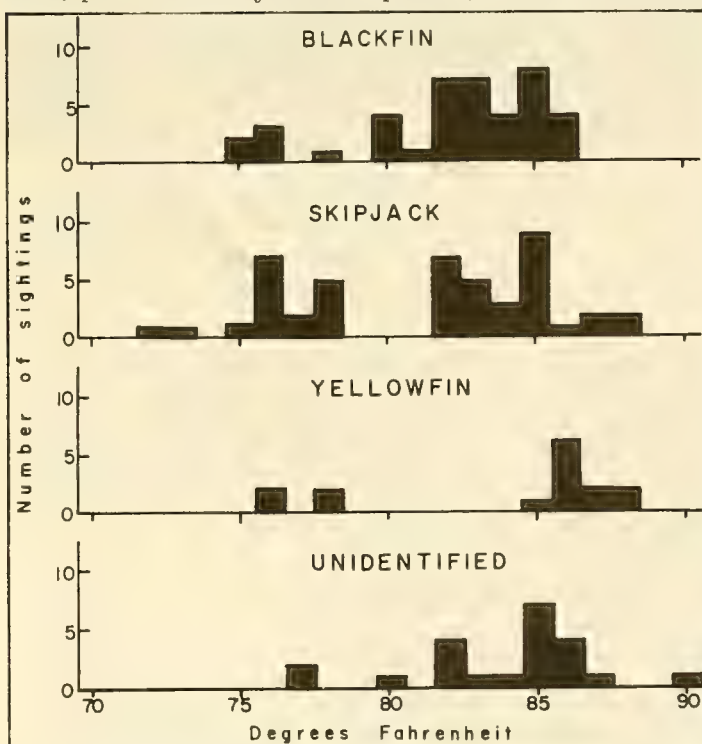


Fig. 4 - Relation of surface temperature to number of surface tuna sightings in the Gulf of Mexico.

BLACKFIN TUNA: The blackfin (*Thunnus atlanticus*) is confined to the western Atlantic and ranges from Rio de Janeiro, Brazil, to southern New England (Mather and Day 1954). It is not known to be caught commercially anywhere except in Cuba. It is rarely caught on long lines although sets using that gear have been made in areas where blackfin were quite abundant on the surface. Indications are that the species generally remains in the upper mixed layers of the ocean and is not a deep swimmer.

Blackfin tuna have several characteristics that are advantageous to commercial exploitation by purse-seine methods:

1. They are frequently found in large dense schools, and thus are easily captured by purse seines.
2. They tend to remain near the surface in the mixed layer and are often sighted feeding on the surface; this is, of course, a prime requisite as the purse seines are set on the sur-

face by sight, and not blind as are long lines and some types of nets. Surface activity by the tuna makes them more susceptible to direct detection or to indirect detection by the presence of bird flocks.

3. Their relatively small size, less than 25 pounds, is desirable because of the ease of handling them, both on the fishing vessel and in the cannery. (Blackfin tuna caught by the R/V Oregon averaged about 9 pounds--ranged 2-25 pounds.)

4. Blackfin are an excellent food fish and can be packed as a lightmeat tuna, giving them a high potential market value.

SKIPJACK TUNA: The skipjack tuna (*Katsuwonus pelamis*) is a cosmopolitan oceanic species thought to be the most abundant tuna in the world. Next to the yellowfin tuna, it comprises the largest portion of the tuna catch brought into United States ports. The catch of that fish is increasing annually, and it seems probable that skipjack will eventually dominate the tuna catch. This future dominance becomes especially apparent when one considers the Eastern Pacific tuna fisheries in which the yellowfin stocks are being overexploited while the skipjack stocks are barely being touched (Inter-American Tropical Tuna Commission 1963).

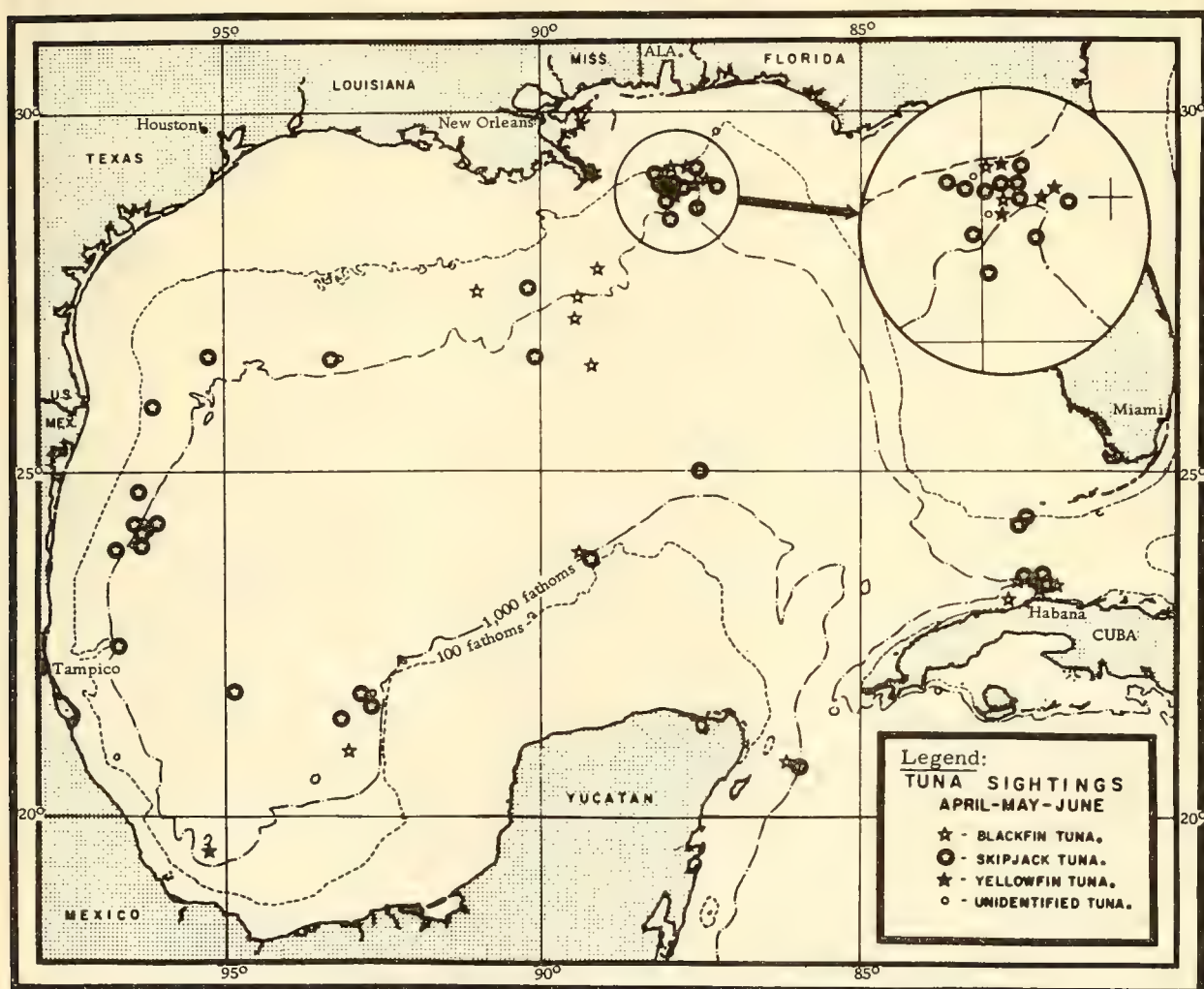


Fig. 5 - Surface sightings of tuna in the Gulf of Mexico during April, May, and June.

The skipjack's habits are similar to the blackfin's, and its marketable value is already proven. The average weight of the skipjack caught from the Oregon in the Gulf was 11 pounds--ranged 3-30 pounds. Surface-school sightings in the Gulf indicate the skipjack may be present in quantities just slightly below the blackfin population. Of the sightings recorded, 34 percent were identified as skipjack, whereas 36 percent were identified as blackfin.^{1/}

OCCURRENCE DATA: Surface tuna schools have been found throughout the year in the southern Gulf but rarely in the northern Gulf from January through March. Surface schools have been found most abundant during summer and fall when the surface water temperature climbs above 75° F. (fig. 4). Although sightings of yellowfin and bluefin tuna have been recorded on the surface in the Gulf, their recorded occurrences there are fragmentary and never in the large quantities reported for blackfin and skipjack.

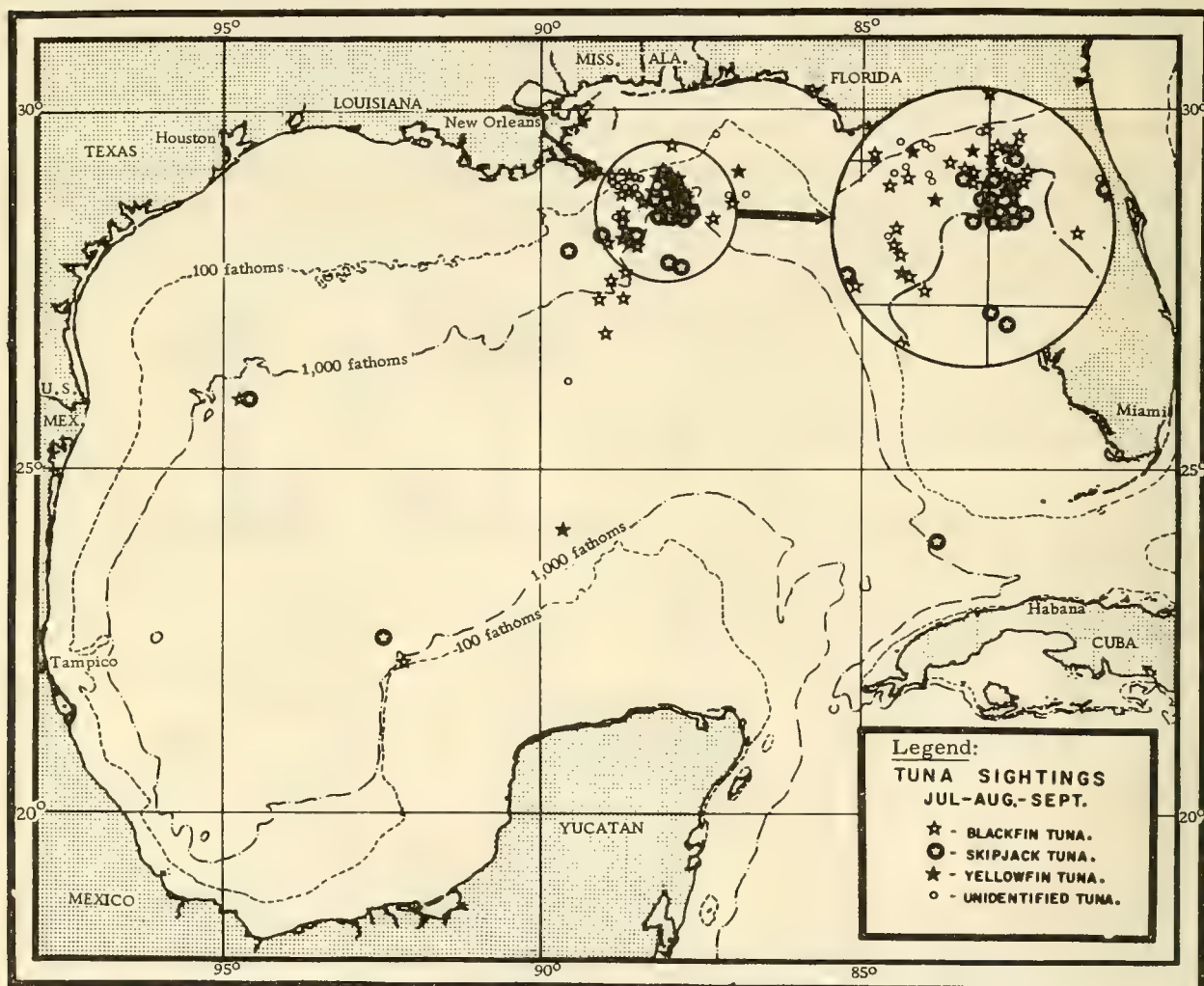


Fig. 6 - Surface sightings of tuna in the Gulf of Mexico during July, August, and September.

Sightings of surface schools of tuna in the Gulf have been plotted by time of year (figs. 5, 6, and 7). Twenty-one of the sightings come from station records of the commercial long-line vessel Milmar. Those records were kept by a U. S. Bureau of Commercial Fisheries

^{1/}Unlike the skipjack, the blackfin is difficult to recognize in the field without captures; therefore, actual sightings of blackfin are undoubtedly greater than the 36 percent would indicate. The greater share of the unidentified sightings (which compose 17 percent of the total reported here) are thought to be blackfin schools.

observer during three of the vessel's cruises in April, May, and June 1958. All other sightings come from station logs of the R/V Oregon. The only species of tuna shown in the figures are the three that constitute the tuna with the greatest commercial potential in the Gulf. Although little tuna (Euthynnus alletteratus) are frequently found in large numbers, their commercial value is less than marginal (Chilton 1949). The albacore (Thunnus alalunga) and the big-eyed tuna (T. obesus) have not been reported from the Gulf. Since blackfin and skipjack tuna are most frequently found on or near the surface, long-line capture records have been plotted when no surface activity was evident in the area at the time of capture. Incidences of their capture with this gear are not numerous. During January, February, and March, tuna sightings have numbered less than a dozen and are, therefore, not shown.

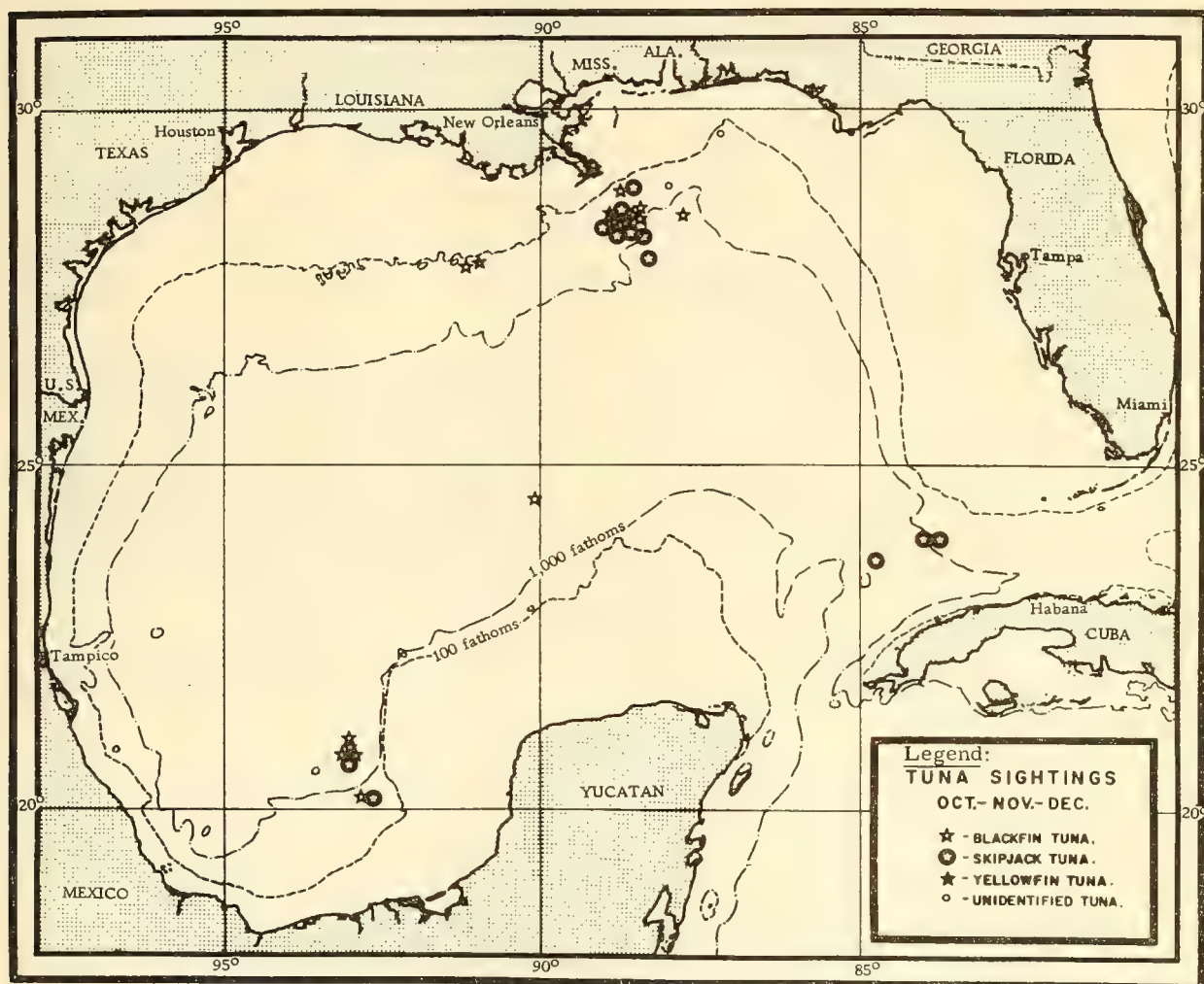


Fig. 7 - Surface sightings of tuna in the Gulf of Mexico during October, November, and December.

Most of the sightings recorded by species have been verified with captures by trolling or pole-and-line gear; other sightings have been identified by observing surfacing fish. Skipjack and large yellowfin, because of their distinctive external appearances, are readily identified if they jump clear of the water and are observed close. The blackfin is difficult to identify without being captured because it may easily be mistaken for little tuna or small bluefin or yellowfin. The three species plotted are generally not found inside the 100-fathom curve in

the Gulf of Mexico.^{2/} Nearly all of the tuna schools identified by captures inside the 100-fathom curve were composed of the little tuna; unidentified tuna schools in those depths have, therefore, not been plotted although there are large numbers of records for such sightings.

The sightings recorded here are but a small portion of those actually made. Many of the sightings were made during the course of other work on the Oregon and recorded as secondary observations. Frequently surface schools of fish that are sighted cannot be investigated because time is limited or because the vessel is engaged in other activities (e.g., trawling or dredging) which preclude any immediate investigations.

The disproportionately large numbers of sightings east and southeast of the Mississippi River may result partly from the fact that explorations in the offshore waters in that rather restricted area have been very extensive compared to other areas in the Gulf.

SUMMARY

1. R/V Oregon explorations for tuna in the Gulf of Mexico have been summarized.
2. Surface sightings of tuna in the Gulf are most frequent from April through December when surface water temperatures rise above 75° F.
3. Blackfin and skipjack tuna are the most abundant surface-occurring tuna in the Gulf of Mexico, comprising 36 percent and 34 percent, respectively, of the identified sightings.
4. Blackfin and skipjack tuna show potential for commercial exploitation by surface fishing techniques.

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^{2/}Along the Atlantic coast, the blackfin is most frequently found inside the 100-fathom curve (Mather 1962). Oregon records indicate the opposite to be true in the Gulf of Mexico.

TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 15--AIRLIFT FOR HARVESTING OYSTERS:

A new machine for harvesting oysters has been developed by the Olympia Oyster Company, Shelton, Wash. This oyster harvester uses high-pressure water jets to loosen the oysters from the sea bed and an airlift pump to bring the oysters to the surface. A patent is pending on this machine (components of the new harvester are shown in figs. 1 and 2).



Fig. 1 - The airlift oyster harvester tied to the dock.

recovers almost all oysters in its path, even on dense beds, and can harvest up to 100 bushels in 10 minutes. David McMillan, manager of the Olympia Oyster Company, designed the harvester to operate in calm waters at depths of 8 to 16 feet. Two men are required to operate the machine.

In addition to bringing large oysters to the surface, the harvester collects and transfers immature oysters from growing beds to fattening beds. The designer believes the harvester improves the condition of the oyster beds by removing silt, and could be easily adapted for harvesting clams.

The high-pressure jet-airlift system takes effect after the forward movement of the harvester has forced oysters into the mouth of the airlift duct. Air, which is pumped into the bottom of the duct, rises and forces water and oysters up the duct and onto the conveyor. The oysters are conveyed onto a barge. The depth of the mouth of the airlift duct is controlled by hollow floats into which water or air is pump-

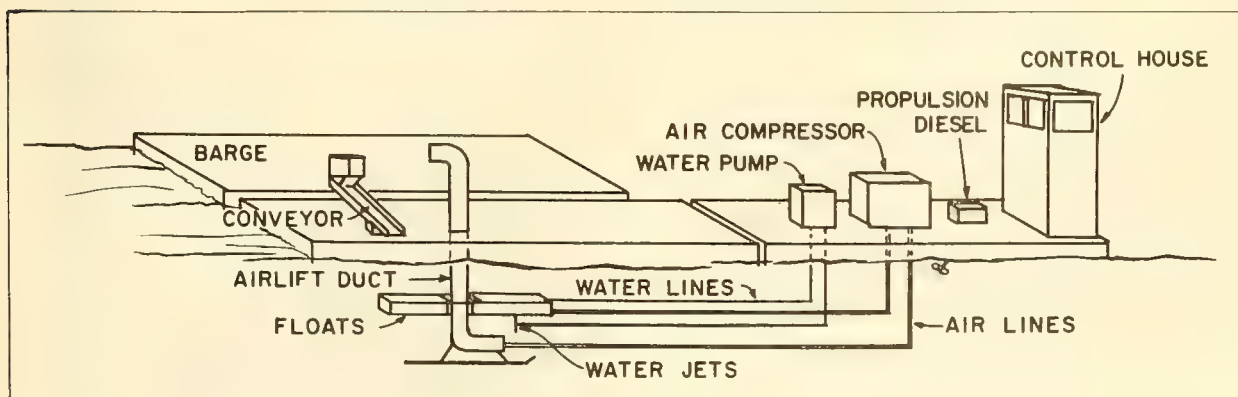


Fig. 2 - A schematic diagram of the airlift oyster harvester showing all the major components.

Depending on bottom conditions, this machine efficiently harvests oysters from a 3-foot-wide swath at speeds ranging from $\frac{1}{2}$ to 3 miles an hour. The harvester reportedly

ed. The outer shell of the duct slides like a telescope to adjust for varying water depth.

The high-pressure water jets are not always needed and are used only on beds that have heavy oyster concentrations or are heavily silted. A propulsion Diesel engine with an outboard attachment moves the harvester over the oyster beds. Controls mounted in the control house provide for steering the harvester and include devices for adjusting the depth of the mouth of the airlift duct and the quantity of air flowing into the airlift duct.

--By Leonard J. Johnson, Mechanical Engineer,
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Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, OCTOBER 1964:

U. S. S. R.: The Soviets maintained a trawling fleet in the Gulf of Alaska throughout October, although its size continued to diminish. By the end of October it was estimated the fleet numbered less than 20 vessels consisting of about 10 to 12 trawlers, 4 reefers, and a few support vessels. During the month the fleet again concentrated on the Continental Shelf edge about 40 miles southwest of Yakutat Bay, an area the Soviets fished heavily in the spring of 1964. Intermittent observations from surface and aerial patrol units indicated they were making excellent catches of Pacific ocean perch.



Fig. 1 - Soviet trawler under way in Bering Sea with all nets aboard.

There were indications that the Soviets had resumed their shrimp fishery in the eastern Bering Sea, presumably in the vicinity of the Pribilof Islands. In late September two trawlers were reportedly dispatched to resume that

fishery, which was started early in the spring of 1964 but came to an end by early June.

There were no sightings of Soviet whaling vessels in the Alaskan area and it was believed their whaling efforts in the North Pacific were over for the year.

Japan: Withdrawal of nearly all Japanese fisheries off Alaska was to be completed by the end of October. The vessel Chichibu Maru, accompanied by 12 trawlers, was licensed by the Japanese to fish throughout the year, primarily for shrimp. Last reports were that the fleet was still operating generally north of the Pribilof Islands, and was expected to continue fishing for shrimp until the end of 1964.

The factory trawler Daishin Maru No. 15 terminated her "exploratory" operations in the Gulf of Alaska and sailed for Japan about



Fig. 2 - Japanese king crab factoryship Tokei Maru. Most of the production consists of canned king crab meat.



Fig. 3 - Small runner boat attached to Tokei Maru.

the middle of October. Of the other 5 trawlers similarly licensed for the Gulf, only the factory trawler Taiyo Maru No. 77 was seen during the month. She was fishing near Portlock Bank east of Kodiak at the time. Licenses issued the 6 "exploratory" vessels for Gulf of Alaska operations reportedly expired October 31, 1964, and they were presumed to have terminated their fishing in the Gulf.

The Tokei Maru and Tainichi Maru king crab fleets, which have consistently fished in the area north of Port Moller, reportedly filled their catch quotas totaling 235,000 cases and left for Japan by late September.



Fig. 4 - Gyokuei Maru fish-meal factoryship operating north and west of the Pribilofs.

Four of the Japanese fish-meal fleets returned to the Alaskan area for a short period from the middle to late September. The Gyokuei Maru, Soyo Maru, and Hoyo Maru fleets operated generally north and west of the Pribilofs, while the Tenyo Maru fleet fished between Unimak Pass and the Pribilof Islands. All of those fleets had left for Japan by the end of September.

None of the 3 Japanese whaling fleets previously seen operating in the vicinity of the Shumagin Islands westward along the Aleutian Chain were sighted during October.

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JAPANESE BERING SEA BOTTOMFISH CATCHES:

A report of a study by the Japan Northern Waters Bottomfish Mothership Council revealed that the total catch of the 14 bottomfish fleets operating in 1964 in the eastern

and western Bering Sea far exceeded the 1963 catch. As of September 20, 1964, it was announced that the catches of those fleets totaled 394,000 metric tons, as compared to 311,000 tons in 1963. Alaska pollock 117,000 tons, flatfish 88,000 tons, herring 42,000 tons, and rockfish 38,000 tons led the landings. Catches of halibut (2,000 tons) and sablefish (6,000 tons) were poor as compared to previous years.

* * * * *

KING CRAB HARVEST AT KODIAK AND WESTWARD:

Because the king crab harvest in the Kodiak area remained at a low level during October 1964 due to lack of facilities after the earthquake, only 14 tagged crabs were caught by commercial fishermen. A year earlier during October, over 200 tagged crabs were taken. The commercial harvest of king crab west of Kodiak Island continued at a higher level than in previous years. Processing plants in the Shumagin Islands area operated at near-capacity. A new plant at Cold Bay began processing king crabs using an operation considered unique for a plant located so far westward. The crabs are cooked, cooled, and shipped by air to markets in other States where they are sold as fresh crab meat. Other processors in the area pack frozen or canned products.

* * * * *

HERRING CATCH FLUCTUATIONS ANALYZED BY COMPUTER:

From computer analyses of the landings of Alaska herring over a period of years, it has been determined that the fluctuations in the catches have not always been due to fluctuations in year-class strength. The analyses cover the years 1929 to 1962 for southeast Alaska, 1937 to 1958 for Prince William Sound, and 1936 to 1959 for Kodiak Island.

With year-class fluctuations discounted, it is possible to assess the effects of other factors on the Alaska herring landings. The annual differences in the availability of herring to the fishermen and also in the catchability of herring by the fishing fleet are two important factors. In addition, there are variations in natural and fishing mortality that may contribute to fluctuations in the catches.

A plan for determining the role of fishing mortality in the seasonal fluctuations in Alaska herring landings is under study at the U.S. Bureau of Commercial Fisheries Biological Laboratory at Stanford, Calif.



Alaska Fishery Investigations

STUDIES ON PINK SALMON MIGRATIONS:

Extensive observations on juvenile pink salmon in Southeast Alaska were made by a biologist of the U.S. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, using the Bureau's research vessels Heron and Blue Boat. In the course of the studies a rendezvous was held with the Fisheries Research Institute vessel Commander working on offshore aspects of the same problem. Although the major migration of juvenile pink salmon into the Gulf from northern Southeastern Alaska in 1964 appeared to be south through Chatham Strait (and not through Icy Strait), many tagging experiments on adult pink salmon in past years have clearly demonstrated that the largest adult spawning runs enter northern Southeastern Alaska through Icy Strait. If juvenile salmon migrations in 1964 are characteristic of other years, an important discovery has been made bearing on salmon homing--the juveniles may be leaving coastal waters by one route and the adults returning to spawn by an entirely different route. This would eliminate the possibility of "retracing their steps" by memory.

* * * * *

SEA WATER MAY ACCELERATE DEVELOPMENT OF PINK SALMON EMBRYOS:

Pink salmon eggs in the Bureau's Auke Bay Biological Laboratory exposed to simulated intertidal incubation conditions at the age of 2 weeks showed a significantly greater embryo head development than eggs exposed to fresh water. The intertidal simulation was obtained by introducing the sea water 4 hours every 12 hours. The results are still inconclusive, but the exposures to sea water caused no mortalities and resulted in slight acceleration in embryo development.

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SALMON SPAWNING BEDS UNSTABLE AFTER EARTHQUAKE:

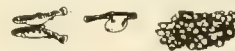
Field work by the U.S. Bureau of Commercial Fisheries on 4 streams being studied in

the Prince William Sound area show that stream bed adjustments as a result of the changes in land elevations following the earthquake are still occurring. Some spawning beds are stranded as new channels are formed during freshets. The behavior of the 1964 Prince William Sound pink salmon spawning migration, the first season after the earthquake, indicates no radical change in spawning behavior despite altered environments. Streams in uplifted areas have not yet reached equilibrium and are shifting their channels. New channel formation may account for some apparently low egg deposition. Uplift has brought former poor intertidal areas up to productive tide levels. But stream flow and digging by spawning salmon have not been sufficient to remove fines from these areas in all streams. In uplifted O'Brien Creek egg deposition was quite high but showed a reduction of live egg abundance from 163 per 0.1 square meter of stream bed to only 68 eggs just previous to hatching.

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KARLUK RED SALMON RUN INCREASES IN 1964:

An estimated 538,000 red salmon escaped into the Karluk system. A substantial bimodal fall run boosted the 1964 escapement to the second highest in 11 years. The average escapement since 1955 has been about 344,000 fish. The commercial catch for the Karluk district was 213,000 bringing the total run for 1964 to 751,000. An egg mortality study in the Grassy Point Creek tributary to Karluk Lake revealed an 8.8 million egg loss of the 10.5 million egg potential. The loss can not be explained by bear predation and will be investigated further. Since 1961, older smolts have become more numerous in the Karluk outmigration. The present dominant 3-plus age group constituted 66 percent of the 1964 outmigration. The 3-plus age group comprised only 6 percent of the 1961 outmigration. The significance of this shift in age group is not clear, but a similar change has also occurred in Bristol Bay runs.



American Samoa

TUNA PRICES:

The following prices for tuna delivered to the United States processing plants in American Samoa were agreed upon for November 1964 following negotiations conducted be-

tween Japanese trading firms and the United States packers located on that Island:

Species		US\$/short ton
Albacore	(iced)	310
"	clipper (froz.) . . .	325
Yellowfin	(frozen)	285
Big-eyed		
under 90 lbs. (frozen)	. . . . .	275

Note: The albacore are fish over 45 pounds and the yellowfin and big-eyed are gilled-and-gutted fish.

Source: Suisan Keizai Shimbun, November 8, 1964.

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JAPANESE TUNA VESSEL OPERATORS SEEK USE OF LARGER VESSELS:

The Japanese Overseas Tuna Fishery Co-operative Association (formed by vessel owners affiliated with a particular Japanese fishing firm), Japan, is seeking a change in the Japanese Government size restrictions on Samoan-based tuna vessels, from the present 180-gross ton limit to 240 gross tons. The Association members maintain that, despite the higher hook catch rate achieved in 1964 in the South Pacific as compared with 1963, the Japanese tuna fleet in American Samoa is dwindling because vessels under 180 gross tons cannot operate profitably due to the high costs of fuel and other supplies at that base. Moreover, they point out that the remarkable growth of the Korean fishing fleet in American Samoa and the resultant intensification of competition on the fishing grounds with Japanese vessels have dampened the enthusiasm of Japanese fishing crews to fish out of Samoa. To overcome these management problems and to increase operating efficiency, they are urging the Government to make special provisions permitting larger vessels to operate from that base.

The Government is not likely to act readily on this proposal since it feels that consideration should also be given to other matters, such as the condition of resources. (Suisan Keizai Shimbun, October 20, 1964.)



Cans--Shipments for Fishery Products, January-August 1965

A total of 1,918,909 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-August 1964, a decrease of 9.2 percent from

the 2,114,241 base boxes used during the same period in 1963. The decline is due partially to a drop in the canning of jack mackerel and Maine sardines.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.



Caribbean and Tropical Atlantic

FISHERY RESOURCE SURVEY CONTINUED:

M/V "Oregon" Cruise 94 (August 24-October 8, 1964): This 45-day cruise in the eastern Caribbean Sea by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon was the first in a series conducted in cooperation with the United Nations Special Fund Caribbean Fisheries Project. The cruise was also a continuation of the general Caribbean and Tropical Atlantic faunal survey and fishery resource evaluation started by the Bureau in 1957.

Preliminary survey coverage during the cruise was obtained in the general area of the Lesser Antilles and between Barbados and Aves Island. Fishing emphasis was placed on pelagic species using surface gear. Where



Fig. 1 - M/V Oregon docked at Fort-de-France, Martinique, in September 1964. This was one of the port calls made during cruise 94.



Fig. 3 - M/V Oregon's port call to Fort-de-France attracted visitors.



Fig. 4 - Personnel aboard the M/V Oregon explain function of a dredge to Martinique newsmen while vessel was docked at Fort-de-France.



Fig. 5 - Two fish specimens caught by the M/V Oregon during cruise 94. The specimens had been frozen after being captured and were brought up on deck for showing to the visitors and newsmen while the vessel was at Fort-de-France.

tracted to the light. During one hour, 150 pounds were dip-netted and frozen for use as long-line chum.

Other species caught on trolling lines maintained while steaming between fishing stations were: 1 yellowfin tuna, 9 little tuna (Euthynnus alletteratus), 4 common dolphin, 5 great barracuda, and 1 cero mackerel (Scomberomorus regalis). Length, weight, sex, and stomach contents were recorded for each fish.

A total of 24 trawling and 38 dredging stations was made in the general vicinity of Barbados, Tobago, and Los Testigos and the western side of the Windward and Leeward Islands from Grenada to St. Christopher. Catches of 5 to 45 pounds of 10- to 16-count (heads-off) brown shrimp (Penaeus aztecus) per 60-minute drag with a 40-foot flat trawl were located in a limited area of trawlable bottom in 36 to 48 fathoms off the southwest end of Tobago. In depths ranging from 200 to 340 fathoms north of Tobago, various shrimp species of potential commercial value including red shrimp (Hymenopenaeus robustus, Aristaeus antillensis, and Penaeopsis megalops), scarlet shrimp (Plesiopenaeus edwardsianus, Aristaeomorpha foliacea), and striped shrimp

(*Plesionika longipes*). The best drag (200 to 240 fathoms) yielded 80 pounds of red shrimp of the *P. megalops* species (100 heads-off count), 40 pounds of the *H. robustus* species (26-30 heads-off count) and 10 pounds of lobsterettes (*Nephrops binghami*). In that general depth range, other invertebrates of potential commercial use included several pounds per drag of *Polychaetes sculptus* and *Geryon* and other crabs. Also in that depth range, the catches were dominated by gadi-forme fishes (Gadidae and Macrouridae) and deepwater apogonids (*Synagrops* sp.).

During the cruise, reef fishes were sampled at Aves and Cannouan Islands. One vertical drift-line station from the surface to 240 fathoms was attempted off St. Vincent, but with negative results. The vessel made port calls in Martinique, Barbados, and Trinidad to embark and debark observers and trainees taking part in the cruise. The vessel returned to its base on St. Simons Island, Ga.

Note: See Commercial Fisheries Review, September 1964 p. 22.



Central Pacific Fisheries Investigations

EXPERIMENTS ON TUNA RESPONSE TO OUTSIDE STIMULI:

Measuring the responses of tuna to external stimuli has been of interest for several years to scientists of the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Experiments carried out in the Laboratory's large shoreside tanks have been undertaken to study the responses of skipjack, yellowfin, and little tuna to light, odor, and underwater sound.

In the summer of 1964, new experiments using new methods and techniques were successfully conducted. Two visiting scientists from New York City conducted electrophysiological and neuroanatomical studies of the lateral line system of spinalized skipjack tuna. The method involved immobilizing the fish and supplying it with oxygenated sea water through a plastic tube affixed to its mouth. The experiments were conducted in a small tank filled with sea water.

Electric recording of nerve impulses from the lateral line nerve was carried out successfully on several skipjack. A total of 20

skipjack was successfully immobilized as experimental animals for physiological studies--the first time this has been accomplished. The trunk lateral line system of the skipjack seemed to be very different from the systems possessed by many of the less active species of fish which had been investigated previously. A high sensitivity of the lateral line to low-frequency vibrations demonstrated for other species could not be demonstrated for the skipjack lateral line. The lateral line nerve fibers of skipjack could be made to respond with impulses by stimulating the organ fairly strongly with a flow of water or with a camelhair brush. Many observations of reflex body and fin movements reacting to touch stimuli were made during the work.

Complete dissections and drawing of the body lateral line nerve systems were made. Samples of the nerve at numerous sites were taken and were being prepared for detailed microscopic study. The work shows that the system of that nerve in the tuna possesses some interesting variations from those of other species of fish.

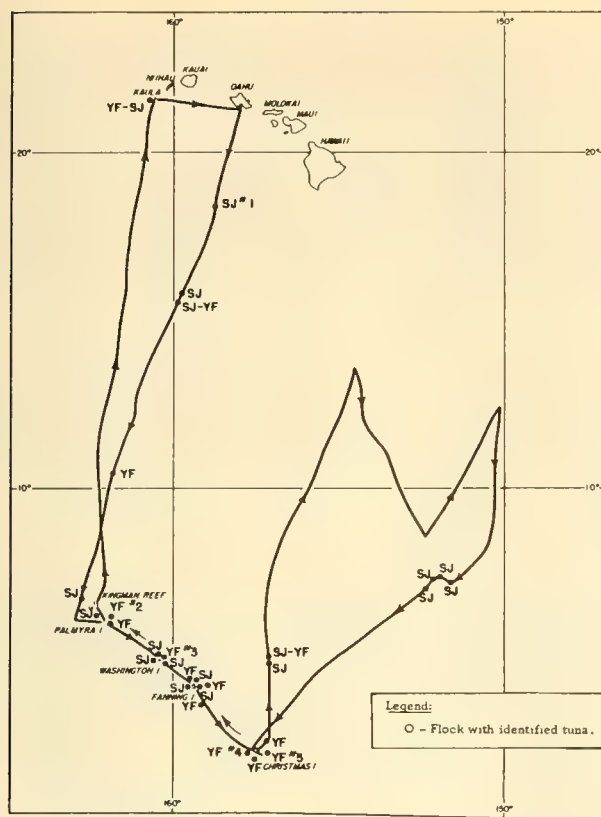
Several conclusions have been drawn from the work done: (1) it is possible to carry out physiological investigations on spinalized skipjack held in small containers; (2) the trunk lateral line system of skipjack does not appear to be used by the fish for detecting low-frequency sounds and its real use is still not known (it is possibly a skin stretch detector; and (3) the lateral line organ is innervated by a deeply lying nerve, the course and branches of which have been traced out.

Note: See Commercial Fisheries Review, May 1963 p. 24.

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SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 76 (September 22-October 28, 1964): To search for skipjack tuna (aku), which occur in the Hawaiian Islands during the summer and all but disappear during the fall and winter, was the principal objective of this 5-week cruise by the research vessel Charles H. Gilbert, operated by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. Other related objectives of the cruise were to: (1) obtain blood and serum samples from skipjack and evaluate them aboard when possible; (2) maintain a stand-ard watch for bird flocks; and (3) collect oceanographic data of various forms.



Cruise track chart of M/V Charles H. Gilbert, Cruise 76 (September 22 to October 28, 1964).

The research vessel's area of operations during the cruise was among the Line Islands and to an area east of those Islands, roughly 700 miles south of Oahu (about $6^{\circ}30' N.$, $162^{\circ}30' W.$ to approximately $2^{\circ}00' N.$, $157^{\circ}30' W.$ and along the area of converging currents from approximately $8^{\circ}30' N.$ to $13^{\circ}30' N.$ and $158^{\circ}00' W.$ to $150^{\circ}00' W.$

Skipjack tuna populations in the Pacific are divided into a number of reproductively isolated groups called subpopulations. At least two of those groups make up the skipjack catch of the Hawaiian pole-and-line fishing fleet. Those subpopulations can be identified by the fish's blood types using methods which are analogous to methods used to identify blood types such as A, B, AB, and O and the Rh factor in man.

Skipjack encountered during the cruise, both in the Line Islands and in the open ocean, were fished using Hawaiian pole-and-line methods. Fishing was very poor and few samples were obtained. An additional purpose of

the cruise was to examine the blood types of the yellowfin tuna or "ahi," and compare them with the blood types of yellowfin in Hawaii. Yellowfin tuna fishing turned out to be excellent and sufficient numbers were caught to provide excellent samples. The results of the serological studies on those yellowfin suggest that those caught in the Line Islands were from a different subpopulation than those caught off Kaula Island, a small island near Niihau in the Hawaiian chain.

Serological and genetic studies of the skipjack and yellowfin tuna make it apparent that those species are grouped in several reproductively isolated subpopulations. The subpopulations are distributed in a yet to be discovered pattern across the Pacific.

During the cruise, a total of 14 skipjack schools (9 in the Line Islands and 5 in the convergence zone) were sighted but none were caught. Samples from 2 schools (117 skipjack) were obtained within 1 day's run of the Hawaiian Islands. One sample of 65 skipjack bloods and a total of 149 yellowfin bloods were processed on board the vessel. In addition, 30 absorptions were performed.

A total of 17 skipjack schools, 18 yellowfin schools, 2 mixed schools (yellowfin and skipjack), and 14 unidentified schools were observed.

A total of 121 yellowfin blood samples were collected in small vials containing glycerin solution, and 42 large volume yellowfin blood samples were collected in jars of glycerin solution to test the practicality of collecting frozen tuna blood samples. Serum samples of 109 yellowfin were collected. Many oceanographic observations were also made.

Note: See Commercial Fisheries Review, December 1964 p. 35.

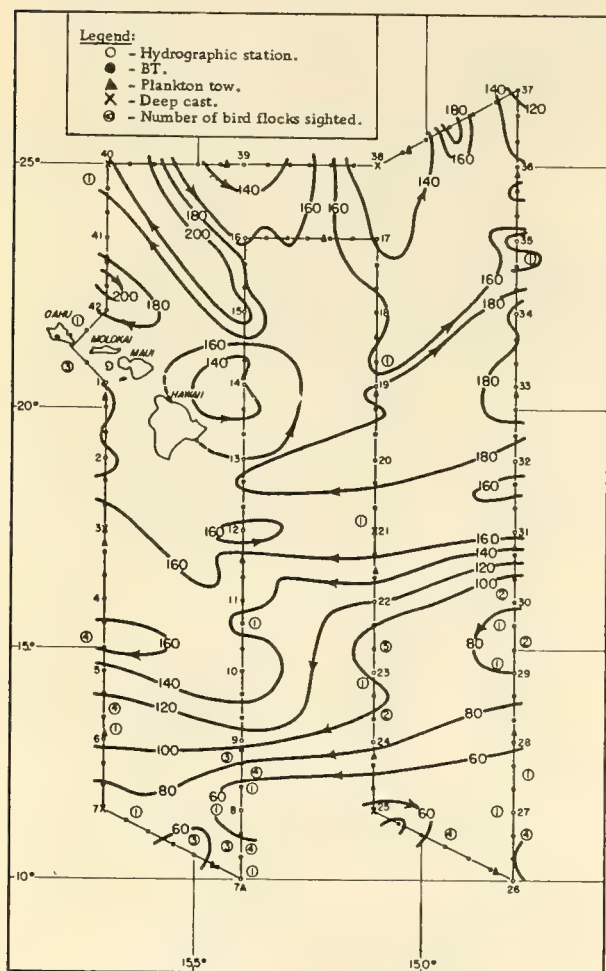
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TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 9 (October 1-20, 1964): The eighth in a series of oceanographic cruises to determine rates of change in the distribution of properties in the trade wind zone of the central North Pacific Ocean was completed October 20, 1964, by the research vessel Townsend Cromwell. The vessel is operated by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The area of operations was

in the Central North Pacific bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W.



Track chart of the research vessel Townsend Cromwell Cruise 9 (October 1-20, 1964), showing depth contours of the 20° C. isotherm in meters.

A total of 43 oceanographic stations were occupied along the cruise track and station temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (about 4,100 feet). Deep casts to 4,000 meters (about 13,100 feet) were taken at stations 3, 7, 21, 25, 38, and 40, with an additional sample at 5,000 meters (16,400 feet) at station 21.

The surface circulation and the temperature distribution in the cruise area during October suggest continuing changes attributed to the onset of the winter situation. The heightened intensity of the westerly flow of the North Equatorial Current noted during Sep-

tember was still evident. The general pattern observed in the north was nearly the same with one significant change. A large counterclockwise eddy appeared just to the east of the Island chain. A similar eddy pattern was also evident in the area during the February 1964 survey (Townsend Cromwell Cruise 1). In the southern region, the depth of the mixed layer markedly decreased from that in the summer situation with the colder water moving much nearer the surface.

A total of 63 bird flocks were sighted during the cruise; 11 being associated with skip-jack schools. The fish schools associated with the remaining 52 were not identified. The majority of the schools was located south of 16° N.; 4 of the schools were sighted near the Islands and 4 in the northern section of the cruise area.

During the cruise bathythermograms (BT) were obtained at 30-mile intervals along the cruise track. Other operations included: (1) obtaining surface bucket temperatures and water samples for salinity analysis at each BT observation; (2) made dissolved oxygen determinations for each water sample at stations 7A to 16, 26 to 37, station 39, and for the deep bottles of the cast at stations 25, 38, and 40; (3) released 10 plastic-enclosed drift cards at 30-mile intervals along the entire cruise track; and made other observations.

Note: See Commercial Fisheries Review, December 1964 p. 34.



Chesapeake States

FISHERIES LANDINGS, 1963:

The 1963 commercial catch of fish and shellfish landed in the Chesapeake States (Maryland and Virginia) was 430.2 million pounds valued at \$29.5 million ex-vessel. That was a decrease of 91.3 million pounds (18 percent) and \$4.1 million (12 percent) from the previous year due mainly to lower catches of menhaden, crab, and oysters.

In 1963, the Chesapeake catch of menhaden totaled 259 million pounds (down 68.9 million); blue crab landings totaled 66.1 million pounds (down 20.4 million); and the oyster harvest yielded 18.3 million pounds (down 1.7 million). Moderate decreases occurred in the 1963 catch of catfish and bullheads, croaker, scup, and white perch. How-

ever, Chesapeake tuna landings showed a striking increase in 1963 as purse-seine vessels landed 3.1 million pounds of bluefin, skipjack, and yellowfin at Maryland ports.

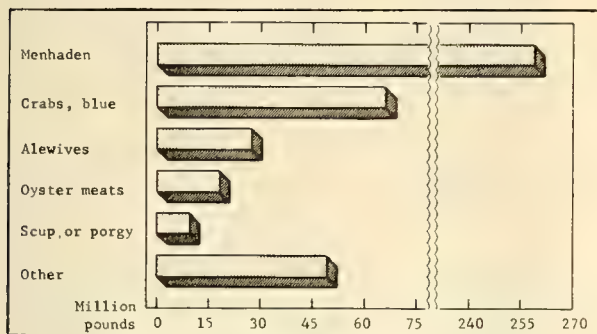


Fig. 1 - Chesapeake States catch, 1963.

Of the total landings in the Chesapeake States in 1963, Virginia produced 374.7 million pounds (87 percent) valued at \$18.7 million (64 percent). The Maryland and Virginia catch was taken by 17,784 fishermen operating 1,274 vessels (craft of 5 net tons and over), 9,495 motor boats, and 888 other boats. The Chesapeake fishery included 65 sailing vessels of 5 net tons and over.

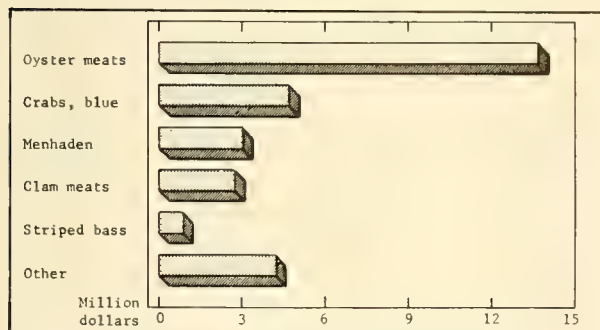


Fig. 2 - Value of Chesapeake States catch, 1963.

Virginia and Maryland produced manufactured fishery products with a total value in 1963 of \$58.2 million at the processors' level--a decrease of \$3.4 million from 1962.



Consumption

PER CAPITA FOOD CONSUMPTION (INCLUDING FISH) INDEX REVISED:

The "Per Capita Food Consumption Index" (includes fishery products) of the U.S. Department of Agriculture has been completely revised. The revised data for selected years

since 1909 were published in Agriculture's National Food Situation, November 1964. Changes in that index include recombining quantities beginning with the year 1955 using retail prices in 1957-59 as index weights, use of marketing loss factors, the addition of Alaska and Hawaii since 1960, the addition of a few new commodities, and alteration of certain commodity groupings.

The per capita food consumption index is a retail-price-weighted quantity index. Average retail prices in 1947-49 were used to weight the index for all years through 1954. Beginning in 1955, average retail prices in 1957-59 were used as weights. The index was linked at 1955.

United States Civilian Per Capita Consumption of Fishery Products (Edible Weight), Selected Years 1947-64

Type	1/1964	1963	1962	1961	Average 1957-59	Average 1947-49
Fresh and frozen	2/	5.8	5.8	6.0	5.7	5.7
Canned 3/	2/	4.3	4.4	4.3	4.2	4.1
Cured	2/	0.5	0.5	0.5	0.6	0.6
Total	10.7	10.6	10.7	10.8	10.5	10.4

1/Preliminary.

2/Not available.

3/Excludes canned food products containing small quantities of fish, such as clam chowder.

Note: Alaska and Hawaii included since 1960.

The 1957-59 prices were taken from those collected by the Bureau of Labor Statistics when they were appropriate, but many items were not priced by them, or at least not in the form in which quantities were measured. Since those prices are averages for products with rigid specifications for grade and form, it was necessary to adjust some prices to represent the average of all products consumed. Retail prices compiled by Statistical Reporting Service for use in the family living component of the Prices Paid Index sometimes were used since they relate to all products as purchased. It was necessary to use some price relationships derived from the 1955 Household Food Consumption Survey in adjusting prices from other sources or deriving composite prices. This survey covered farm and rural nonfarm as well as urban consumers.

The variation in the per capita consumption of fishery products from 1961 through 1964 has been almost insignificant. However, the amount of fishery products actually consumed has increased in order to take care of the substantial increase in population. (National Food Situation, NFS-110, November 1964, Food Consumption and Utilization Section,

Economic and Statistical Analysis Division,
U.S. Department of Agriculture.)



Crab

UNITED STATES-JAPANESE TALKS ON KING CRAB FISHING IN EASTERN BERING SEA CONCLUDED:

Consultations between the United States and Japanese delegations on king crab fishing in the eastern Bering Sea, held at Washington, D. C., starting October 15, 1964, were successfully concluded, announced the State Department on November 14, 1964. The delegations agreed to recommend to their respective Governments arrangements to govern the king crab fishery of both countries in the eastern Bering Sea for a period of two years, at the end of which time the two Governments would undertake to hold further similar consultations.

Included in the proposed agreement are: (1) provisions for a level for the Japanese king crab catch in the area of the traditional Japanese fishery in the eastern Bering Sea, (2) interim conservation measures to be applied to the fishermen of both countries in the area, (3) continued and intensified scientific study of the king crab resource, and (4) enforcement of the terms of the agreement. In order to minimize the possibilities of conflict resulting from the differing types of fishing gear, the agreement would specify an area in which only crab pots would be used for commercial crab fishing.



Alaska king crab (*Paralithodes camachatica*)

The consultations were held in fulfillment of the pledge made by President Johnson May 1964 that before implementing the provisions of Public Law 88-308 (the so-called Bartlett Act), the United States would consult with Japan and would give full consideration to Japan's long established king crab fishery. Faced with the opposing legal positions of the two Governments regarding rights under international law to fish the king crab resource, the two delegations agreed on practical arrangements without prejudice to the legal position of either side.

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CONFERENCE ON TECHNOLOGY OF KING CRAB PROCESSING:

A two-day conference on the technology of king crab processing was held October 19 and 20, 1964, at the U. S. Bureau of Commercial Fisheries Technological Laboratory, Ketchikan, Alaska. A similar conference on king crab was held in 1962 at the same location. The conference was attended by about 40 fishery industry people representing a wide range of interests in the king crab fishery.

The conference agenda was divided into six major sessions according to the subject matter of the topics. The first session was of a general nature for the purpose of providing information

on the conservation of the king crab resource, foreign interests and their utilization of the resource, and the results of some



Washing and checking meat removed from king crabs in a plant in Alaska.

preliminary exploratory fishing efforts by the Bureau. The first and second technical sessions centered on technological research progress on problems related to the processing of king crab. Lively discussions followed each research progress report since some of the reports provided information that is significant and has immediate applicability by the industry.

The third technical session provided information on Bureau technological research programs which were of indirect interest to the king crab industry. The topics in this session covered research progress on Dungeness crab processing, mechanization of the blue crab industry, and the need for maintaining a sanitary operation in the production of all types of crab meat.

The final two sessions of the conference were of workshop type in which samples of canned and frozen crab meat were examined and evaluated. The purpose of the product cuttings was to observe specific product defects and to discuss processing variables which may influence their occurrence. The consensus was that the quality of crab meat had increased over their average quality level of two years earlier.

A panel of industry representatives was selected at the beginning of the conference to evaluate the conference itself, and to provide some guidelines to the Bureau with respect to the future direction of research on king crab. The panel lauded the work that has been accomplished to date, requested a balanced future program of basic and applied research on king crab, and requested that a third king crab conference be scheduled within the next two years.

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ECONOMIC AND MARKETING STUDY OF DEEP-SEA RED CRAB UNDERTAKEN:

A marketing and economic study of the commercial potential of the deep-sea red crab has been undertaken by a University of Rhode Island fisheries economist, announced the University's Director of Public Information, November 13, 1964. Found along the Continental Shelf, ranging from Nova Scotia to Cuba, the deep-sea red crab is now dumped back into the sea by offshore lobstermen who consider them a nuisance.

The University's associate professor of food and resource economics conducting the study said, "If I had a choice between red crab and lobster, I would take the crab. There's no doubt about it in my mind." He obviously speaks from experience, having eaten that species of crab since last fall,

when he arrived in the United States from Rome, Italy, where he had been with the United Nations' Food and Agriculture Organization (FAO).

Bright red when alive and possessing a delicate flavor, the crabs caught by trawlers weigh between 1 and 2 pounds and are about twice the size of the blue crabs which are the mainstay of a substantial industry in the Chesapeake Bay area. Catches of 3,000 to 4,000 pounds of the red crab have been obtained in a one-hour tow. In contrast, it takes an 80- to 90-foot vessel operating out of Rhode Island ports 4 nights and days of trawling to obtain an average catch of 8,000 pounds of lobster.

From the two dozen red crabs cooked and dissected at the University of Rhode Island Agricultural Experiment Station, it was found that 3 average size ones yield about 1 pound of meat. About 24 percent of the meat was in the claws, 36 percent in the legs, and 40 percent in the body. A taste panel, established by the Technological Laboratory of the U.S. Bureau of Commercial Fisheries at Gloucester, Mass., had previously judged the quality, texture, and palatability of crabs cooked at sea and immediately frozen as "good." On another occasion a Rhode Island fish and shellfish dealer hand-picked about 500 pounds of the meat and sold it at retail both in the fresh and frozen form.

Despite the encouraging evidence, the economist making the study is not yet ready to suggest the red crab will form the basis for a new industry. But he does believe that if several major problems can be solved, then New England offshore lobstermen might find red crab fishing profitable because they are already equipped for the deep-sea trawling necessary. "Since the offshore lobster season is limited to the first half of the year, trawling for crabs during fall and early winter might be a satisfactory complementary activity which could offset the seasonability of employment in the lobster industry both at sea and ashore," he explained.

Normally, the crabs are found in waters of more than 200 fathoms (1,200 feet) with the density very great at 250 fathoms. Whether the crabs reproduce fast enough and exist in sufficient numbers to stand up to extensive fishing is not known. Yet today the crabs which seem to congregate in pockets are sometimes caught in such quantities that "lobster boats leave an area to avoid catching them," the economist said. The problems to be solved, according to the economist, are how to preserve the catch and how to process it cheaply once it gets ashore. Unlike the lobster, he does not believe the red crab will survive for extended periods in salt-water tanks aboard ship. This suggests that some method will have to be found to ice the catch. But how long will they last on ice? Will the keeping quality vary from season to season? Would it be better to ice down the catch as it comes aboard or should the catch be bagged first and then iced to reduce handling costs and expedite unloading in port? Will extra crew members be required?

The red crab has a softer shell than lobsters, somewhat elongated spidery legs, and often loses a claw or a leg during the rough ride when it is scooped off the bottom and dumped aboard the vessel. Of the samples brought to the University for study, only 10 percent of the crabs were intact. The damaged ones are liable to die and spoil any whole crabs in a salt-water tank. The second hurdle to be cleared involves finding an economical way of removing the meat from the shell. In the Chesapeake Bay area hand-picking is done, but the economist said the comparatively high costs of labor in Rhode Island and New England might preclude a similar setup. Possible alternatives include shipping the red crabs to an area where experienced hand pickers can be used at a reasonable cost or adapting present mechanical equipment used to remove meat from blue crabs. In addition, the economist believes there may be a way of marketing whole deep-frozen crabs, after the shell has been opened and it has been cleaned inside.

Limited explorations of the distribution of the red crab were carried out in 1959-1960 by the U.S. Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base at Gloucester, Mass. In December 1963 the U.S. Bu-

reau of Commercial Fisheries published Fishery Leaflet 550 which stated, "As trawlers become equipped for fishing in greater depths, this species may become the source of a commercial fishery. At present, the deep-sea red crab remains an untouched resource of unknown value and extent."

Local fishermen and fish and shellfish dealers have already expressed an interest in the red crab study and volunteered their assistance. Meanwhile, the University's economist has been communicating with blue crab processors in the Chesapeake Bay area and will visit them. He expects the initial phase of his work to take about a year. (Press Release of University of Rhode Island, Kingston, November 13, 1964.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-OCTOBER 1964:

Fresh and Frozen: Purchases of fresh and frozen fishery products in October 1964 for the use of the Armed Forces were down 15 percent in quantity from the previous month, although the value of the purchases was about the same in both months. In October 1964 purchases were up for shrimp, but down for scallops, ocean perch fillets, and haddock fillets and portions. Average prices in October 1964 were higher for shellfish items--particularly for peeled and deveined shrimp.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subistence Supply Centers, October 1964 with Comparisons

QUANTITY				VALUE			
Oct.	Jan.	Oct.	Jan.	Oct.	Jan.	Oct.	Jan.
1964	1963	1964	1963	1964	1963	1964	1963
..... (1,000 Lbs.) .....				..... (\$1,000)			
2,252	1,817	22,330	19,490	1,484	975	12,303	10,917

Compared with the same month in the previous year, purchases in October 1964 were up 24 percent in quantity and 52 percent in value. Among the leading items, shrimp purchases showed the largest increase in spite of a substantial gain in price. The upward trend in prices for most items in October 1964 was partly offset by lower average prices for ocean perch fillets, haddock fillets, and oysters.

Total purchases in the first 10 months of 1964 were up 15 percent in quantity and 13 percent in value from those in the same period of the previous year. Purchases of shrimp and scallops showed the largest increase. There was some decline in purchases of cod fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

Table 2 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, October 1964 with Comparisons

Product	October				January-October	
	1964		1963		1964	1963
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	
	Pounds	Cents/Pound	Pounds	Cents/Pound	. . . . (Pounds)	
Shrimp:						
Raw headless	133,850	90.6	1/	1/	1,104,400	1/
Peeled and deveined	258,414	120.4	1/	1/	1,319,036	1/
Breaded	343,370	83.2	1/	1/	3,519,220	1/
Molded and breaded	71,550	60.9	1/	1/	421,320	1/
Total shrimp	807,184	94.4	663,080	78.4	6,363,976	5,681,744
Scallops	111,200	63.5	101,100	55.6	2,422,350	2,163,207
Oysters:						
Eastern	78,227	109.5	1/	1/	707,541	1/
Pacific	57,610	66.3	1/	1/	292,682	1/
Total oysters	135,837	91.2	101,502	95.7	1,000,223	985,225
Clams	7,450	31.2	17,772	29.8	223,353	219,142
Filletts:						
Cod	70,750	33.5	77,740	28.3	453,216	566,425
Flounder	253,150	27.7	225,000	26.6	2,696,652	2,614,927
Ocean perch	269,300	28.6	246,190	32.0	3,060,720	3,178,841
Haddock	67,700	32.2	182,800	35.4	1,651,554	1,849,376
Haddock portions	102,358	45.6	-	-	439,822	-
Steaks:						
Halibut	116,200	44.8	86,100	37.8	1,132,327	1,194,173
Salmon	55,170	66.7	20,100	56.7	228,445	163,750
Swordfish	775	59.2	1,680	55.0	11,410	25,748

1/Breakdown not available.

Canned: The purchases of canned fishery products in October 1964 included over 2 million pounds of canned salmon. That was the first large purchase of canned salmon by the Department of Defense since January 1964. In recent years most of the canned salmon requirements of the Armed Forces have been purchased in the fall of the year. Purchases of other canned fishery products are spread more evenly over the year.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, October 1964 with Comparisons

Product	QUANTITY				VALUE			
	Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
	1964	1963	1964	1963	1964	1963	1964	1963
Tuna	530	(1,000)	2,814	2,992	229	(1,000)	123	1,420
Salmon	2,068	1,448	2,749	1,478	1,213	875	1,630	895
Sardine	33	24	293	399	19	8	172	158

In the first 10 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 61 percent in quantity and 59 percent in value due to larger purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See *Commercial Fisheries Review*, Dec. 1964 p. 37.



Fish Sticks and Portions

U.S. PRODUCTION, JULY-SEPTEMBER 1964:

United States production of fish sticks and fish portions amounted to 42.1 million pounds during the third quarter of 1964, according to preliminary data. Compared with the same quarter of 1963, this was an increase of 4.8 million pounds or 12.9 percent. Fish portions (25.5 million pounds) were up 4.6 million pounds or 22.3 percent, and fish sticks (16.6 million pounds) were up 167,000 pounds or 1.0 percent.

Cooked fish sticks (15.1 million pounds) made up 90.7 percent of the July-September 1964 fish stick total. There were 25.0 million pounds of breaded fish portions produced, of which 20.0 million pounds were raw. Unbreaded fish portions amounted to 474,000 pounds.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 12.5 and 15.0 million pounds, respectively. The Pacific States ranked second with 2.2 million pounds of fish sticks, and the Inland and Gulf States ranked second with 9.8 million pounds of fish portions.

Table 1 - U.S. Production of Fish Sticks by Months and Type, July-September 1964 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
July	3,413	401	3,814
August	5,689	624	6,313
September	5,950	521	6,471
Total 3rd Qtr. 1964 1/	15,052	1,546	16,598
Total 3rd Qtr. 1963	15,252	1,179	16,431
Total 1st 9 months 1964 1/	48,992	4,312	53,304
Total 1st 9 months 1963	55,381	3,319	58,700
Total Jan.-Dec. 1963	74,132	5,163	79,295

1/Preliminary.

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	12,528	21	12,972
Inland & Gulf States	5	1,865	7	1,883
Pacific Coast States	11	2,205	11	1,576
Total	39	16,598	39	16,431
1/Preliminary. 2/Revised.				

Month	1/1964	2/1963	1962	1961	1960
			(1,000 Lbs.)		
January	7,226	7,554	6,082	6,091	5,511
February	7,061	8,241	6,886	7,097	6,542
March	6,963	8,053	7,658	7,233	7,844
April	5,941	6,546	5,719	5,599	4,871
May	5,422	5,750	5,643	5,129	3,707
June	4,093	6,125	5,117	4,928	4,369
July	3,814	4,870	3,740	3,575	3,691
August	6,313	5,696	5,760	6,927	5,013
September	6,471	5,865	6,582	5,206	5,424
October	-	8,128	6,698	6,133	6,560
November	-	6,471	6,305	6,288	6,281
December	-	5,996	6,027	5,618	5,329
Total	-	79,295	72,217	69,824	65,142
1/Preliminary. 2/Revised.					

Month	Breaded			Un-breaded	Total
	Cooked	Raw	Total		
	(1,000 Lbs.).				
July	768	5,654	6,422	105	6,527
August	1,706	7,363	9,069	256	9,325
September	2,522	6,983	9,505	113	9,618
Total 3rd Qtr. 1964 1/	4,996	20,000	24,996	474	25,470
Total 3rd Qtr. 1963	3,832	16,221	20,053	776	20,829
Total 1st 9 mos. 1964 1/	15,481	58,220	73,701	1,733	75,434
Total 1st 9 mos. 1963	12,052	54,903	66,955	2,229	69,184
Total Jan-Dec. 1963	16,623	74,970	91,593	3,054	94,647
1/Preliminary.					

Month	1/1964	2/1963	1962	1961	1960
			(1,000 Lbs.)		
January	8,526	8,173	5,077	4,303	3,632
February	8,397	7,361	6,360	4,902	3,502
March	8,584	8,835	7,036	5,831	4,706
April	8,064	7,919	6,408	4,484	3,492
May	8,136	7,293	5,818	3,879	3,253
June	8,257	8,774	6,137	4,039	3,995
July	6,527	4,524	4,679	3,962	4,088
August	9,325	6,684	6,687	4,963	3,558
September	9,618	9,621	7,180	5,745	4,631
October	-	9,877	9,871	6,759	5,275
November	-	8,136	7,406	5,789	4,790
December	-	7,450	6,019	5,191	4,459
Total	-	94,647	78,678	59,847	49,381
1/Preliminary. 2/Revised.					

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	15,047	23	10,997
Inland & Gulf States	6	9,769	10	9,124
Pacific Coast States	9	654	9	708
Total	38	25,470	42	20,829
1/Preliminary. 2/Revised.				



Great Lakes

FISHERY LANDINGS, 1963:

The 1963 United States and Canadian commercial catch of fish in the Great Lakes, Lake St. Clair, and the International Lakes of northern Minnesota was 106 million pounds. Landings declined over 17 million pounds compared with 1962. Domestic production accounted for 56 percent of the total volume.

United States fishermen took 59 million pounds of fish valued at \$5.3 million from those lakes in 1963. The quantity declined 6.6 million pounds (10 percent) and value, \$244,000 (4 percent) compared with the previous year. There were slight decreases in the catch of carp, chubs, and lake herring; while moderate increases occurred in landings of sheepshead and smelt.



The State of Michigan led with a catch of over 20 million pounds (2 million pounds less than the previous year). Wisconsin was next with landings of 17 million pounds (down 2 million from 1962). Ohio was third with a catch of 14 million pounds (down 1 million from 1962).

Lake Michigan was the leading contributor to the United States catch (for the fourth successive year) with a yield of 21.0 million pounds--down 2.5 million pounds from 1962. Lake Erie was second with 17 million pounds, followed by Lake Superior with landings of 12 million pounds. The Lake Erie landings fell more than 2 million pounds below the 1962 level, but the Lake Superior catch was about the same as in the previous year.



Great Lakes Fisheries Explorations and Gear Development

SEASONAL DISTRIBUTION AND ABUNDANCE STUDIES OF ALEWIFE, CHUB, AND YELLOW PERCH IN LAKE MICHIGAN CONTINUED:

M/V "Kaho" Cruise 22 (October 19-28, 1964): To extend knowledge of the seasonal distribution and abundance of alewife and chub stocks in northern Lake Michigan and Green Bay, and their availability to bottom trawls, was the primary objective of this cruise by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho. Other objectives were to collect length-frequency data on chub, alewife, and yellow perch, and to collect various species of fish and bottom samples for botulism studies.



Fig. 1 - Exploratory fishing and gear research vessel Kaho of the U.S. Bureau of Commercial Fisheries.

These explorations by the vessel Kaho revealed commercially significant quantities of alewife to be available in central Green Bay, off Sturgeon Bay, Wis., Frankfort, Mich., and in Little Traverse Bay. Good catches of

chub were made off Sturgeon Bay and Frankfort. This information is of special interest to those segments of the fishing industry looking for means to extend the production season for supplying animal-food and fish-meal market outlets.

Fishing Operations: A total of 45 trawl drags were completed with a 52-foot (head-rope) fish trawl during the 10-day cruise. Of the total drags, 18 were completed in Green Bay and 27 in the open lake. All drags lasted 30 minutes except 5 drags, which were terminated early due to snags encountered or for comparison purposes with a previous drag. Heavy trawl damage requiring replacement of the net occurred at 15 fathoms southwest of Washington Island. Minor net damage was encountered on four other occasions. Bottom topography and vertical distribution of fish were continuously monitored and recorded with a high-resolution echo-sounder. Echo-sounding surveys made in the east arm of Grand Traverse Bay indicated most of the area to be unsuitable for bottom trawling.

Fishing Results in Northern Lake Michigan: Commercially significant catches of alewife were taken at 20, 25, and 30 fathoms off Frankfort, Mich.; at 15, 20, 50, and 70 fathoms off Sturgeon Bay, Wis.; and at 20 and 25 fathoms in Little Traverse Bay. Good chub catches were made at 30-45 fathoms off Sturgeon Bay and at 25 fathoms off Frankfort. A good percentage of the chub taken off Frankfort and Sturgeon Bay were large smoker size. One significant catch of sucker (130 pounds) was taken at 35 fathoms in Little Traverse Bay. Smelt were taken in moderate amounts with one drag in 30 fathoms off Sturgeon Bay yielding 90 pounds. No white fish and only 5 individual yellow perch were caught in northern Lake Michigan.

Fishing Results in Green Bay: Catches of alewife were generally light throughout Green Bay with the best catches (500 and 520 pounds) made at 12 fathoms at stations off Washington Island and east of Cedar River. Smelt catches were also light and mostly under 20 pounds for each drag. One drag at 13 fathoms off Cedar River yielded 190 pounds of smelt. South of Menominee, an average of 19 pounds of sucker per drag was taken. Sucker were scarce north of Menominee with the exception of one 300-pound catch taken at 13 fathoms east of Cedar River. Yellow perch were caught in amounts from 1 to 5 pounds in all drags made in southern Green Bay. But no perch were caught at

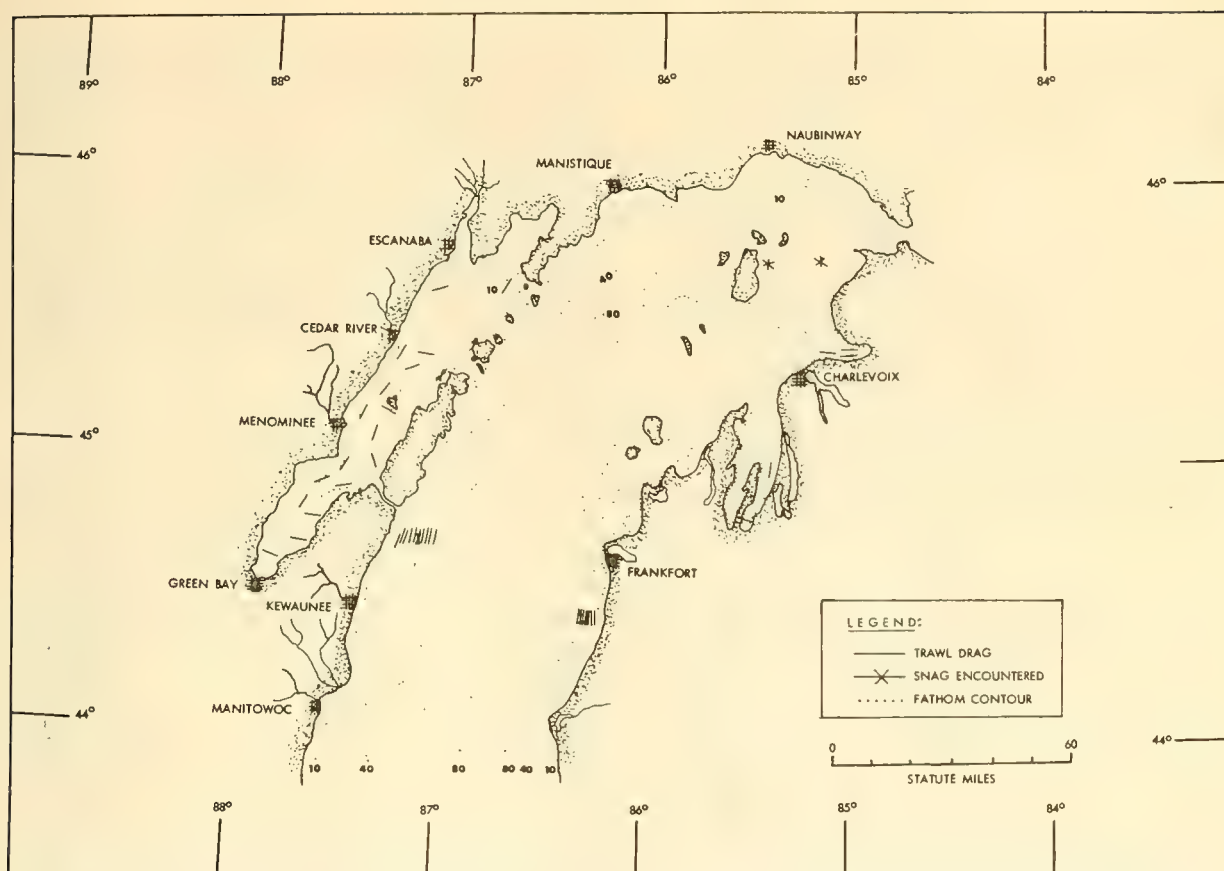


Fig. 2 - Lake Michigan and Green Bay explorations by M/V Kaho cruise 22, October 19-28, 1964.

any stations north of Menominee. Two significant catches of carp (100 and 1,300 pounds) were made in Green Bay at 15 and 10 fathoms, respectively. Catches of other species were insignificant.

Hydrographic data: Surface water temperatures of Lake Michigan ranged from 48.0° to 53.0° F; those in Green Bay from 46.5° to 50.5° F. No thermocline was present in Green Bay, and bottom temperatures varied from 44.6° to 47.4° F. Fishing (bottom) temperatures in Lake Michigan ranged from 39° to 47.4° F. Air temperatures ranged from 39° to 62° F. Bathythermograph (BT) casts were made at each fishing area.

Note: See Commercial Fisheries Review, December 1964 p. 40; November 1964 p. 33.



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 51 -- Phase I (September 3-6, 1964), Phase II (September 15-23, 1964): To initiate evaluation of daytime effectiveness, in clear water, of a trawl designed specifically for electrical shrimp trawling was the primary objective of this cruise in the Gulf of Mexico by the U.S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. A secondary objective was to determine efficiency in night fishing.

Previous daytime tests with an electrical shrimp trawl have yielded excellent results when used in turbid water, but relatively poor results in clear water. Daytime effectiveness on pink shrimp in the Cape San Blas area was much better than experienced previously. Electrical trawl catches were variable--ranging to 100 percent of shrimp available. Night elec-

trical catches of pink shrimp averaged 25 percent below those of the standard trawl. Daylight tests, on brown shrimp, in the Mississippi area ranged to 90 percent of shrimp available. Night catches were between 99 and 137 percent of the standard trawl rate.

Significant design features of the experimental trawl are: a transverse electrode array with an electrical field length of about $8\frac{1}{2}$ feet, a "mud-roller" assembly displayed ahead of the array, and a trawl shaped so that both array and "mud-rollers" are covered by an overhang of the top body section. The purpose of the "mud-roller" assembly is to create a layer of turbid water immediately above the electrode array. The object of the turbidity is to elicit a vertical response from the shrimp rather than the lateral movement obtained when visibility is good.

Comparative trawling methods used were the same as those on previous tests of the electrical shrimp trawling gear, consisting of the experimental gear being towed simultaneously with a standard trawl. Four 1-hour drags were made each day during daylight and four were made after dark. The standard for evaluation purposes was the average catch of the standard trawl night drags (night standard average).

Phase I: This phase was conducted in the Cape San Blas area due south of Cape St. George in 12 to 13 fathoms of water. Only pink shrimp were taken in that location. Shrimp availability was extremely variable due to bottom currents and variable substrate type. The night standard average during the test period ranged between 5 and 31 pounds an hour. The electric trawl daytime catch ranged between 50 and 100 percent of the night standard average. Those results, under clear water conditions, were much better than achieved previously, when electric catches were only 10 to 50 percent of the night yield. Night electric catches were 10 to 20 percent below the standard trawl rate, indicating electrically-induced escapement.

Phase II: The second phase of the cruise was conducted south of Horn Island Pass, Miss., in 13 to 14 fathoms. The catch was composed primarily of brown shrimp. The night standard average catch for the 4 days of testing was 25 pounds an hour with no extreme variability. The day electric catch ranged from 30 to 90 percent of the night standard average. The catches were direct-

ly related to degree of footrope proximity to bottom--when fished light, the catch was poor and when fished harder the catch improved. Night electric catches were 100 to 133 percent of the standard trawl.

In summary, results of this cruise demonstrated that creating a turbid water layer above the electrode array was effective in improving daylight electric catches in clear water. Also, a distinct variability in response between pink and brown shrimp was strongly indicated. This was demonstrated by results of night electric fishing.

After modifications to the design of the trawl used, an exploratory cruise to the Tortugas shrimp grounds was to be conducted by the George M. Bowers during the late fall of 1964. Primary objectives were to be: continued evaluation of daylight electric shrimp trawling on pink shrimp using the "mud-roller" device described, and to remedy the catch reduction experienced at night with that shrimp species.

Note: See Commercial Fisheries Review, July 1964 p. 12; April 1964 p. 18.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-22 (October 20-31, 1964): Better than average individual catches of large brown shrimp averaging about 65 pounds, and a good catch of large and medium size white shrimp were made on this shrimp sampling cruise in the Gulf of Mexico by the chartered research vessel Gus III. The cruise was one of a series in a continuing shrimp distribution study conducted by the U.S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

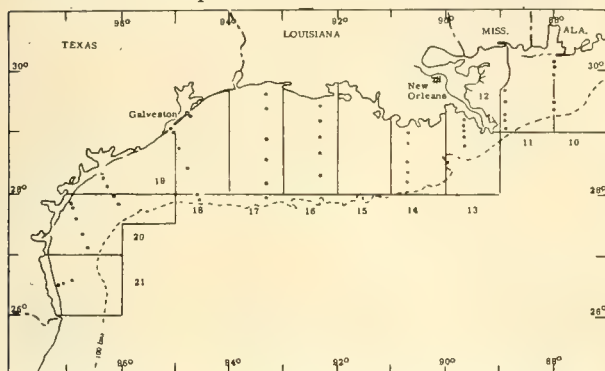
Eight statistical areas from off the Mississippi coast to Texas were covered on this cruise and standard 3-hour tows with a 45-foot Gulf shrimp trawl were made. During the cruise, 35 tows with the 45-foot flat trawl were made, 59 plankton tows, and 42 bathythermograph and 167 water (Nansen bottle) samples were taken. A total of 162 drift bottles were cast at 27 stations.

The largest catch yielding 66 pounds of 15-20 count brown was made in the over 20-fathom depth of area 20; the up to 10-fathom depth

range yielded 14 pounds of 15-20 count white shrimp.

The over 20-fathom depth was the most productive in area 16 with a 63-pound catch of 26-30 count brown shrimp. The other two depths in that area accounted for only a scattering of brown and white shrimp.

Area 21 accounted for 51 pounds of brown shrimp--30 pounds of 31-40 count from the over 20-fathom depth and 21 pounds of smaller size shrimp from 10-20 fathoms.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-22.

A 69-pound catch of large white shrimp was made in area 13, most of it from the up to 10-fathom depth. The catch in area 14 was made up of 20 pounds of white shrimp (21-25 count) from the up to 10-fathom depth and 21 pounds of brown shrimp, ranging from 15-20 count to very small, from the other two depth ranges.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, December 1964 p. 45.



Halibut

"GREENLAND HALIBUT" CORRECT NAME FOR THAT FLATFISH SPECIES:

The U.S. Food and Drug Administration (FDA) has determined that the flatfish "Greenland halibut" (*Reinhardtius hippoglossoides*) bears the proper name and is not "flounder" as an FDA 1963 opinion stated. FDA officials say this new opinion cancels their 1963 opinion which was in error, and that "Greenland halibut" has been the proper name since 1946. Some literature refers to that species as Greenland Turbot or Newfoundland turbot.

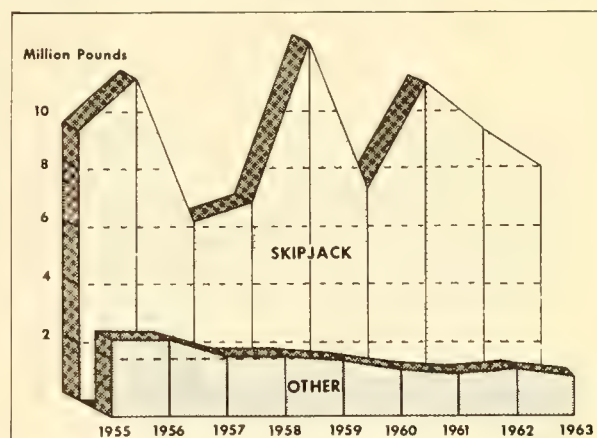
Greenland halibut is found in the Arctic parts of the Atlantic Ocean, south to Finland and the Grand Banks.



Hawaii

FISHERIES LANDINGS, 1963:

The 1963 commercial catch of fish and shellfish in the State of Hawaii totaled 11.7 million pounds valued at \$2.7 million ex-vessel. Compared with the previous year, that was a decline of 1.4 million pounds (11 percent) and \$140,700 (5 percent)--due largely to reduced skipjack tuna landings.

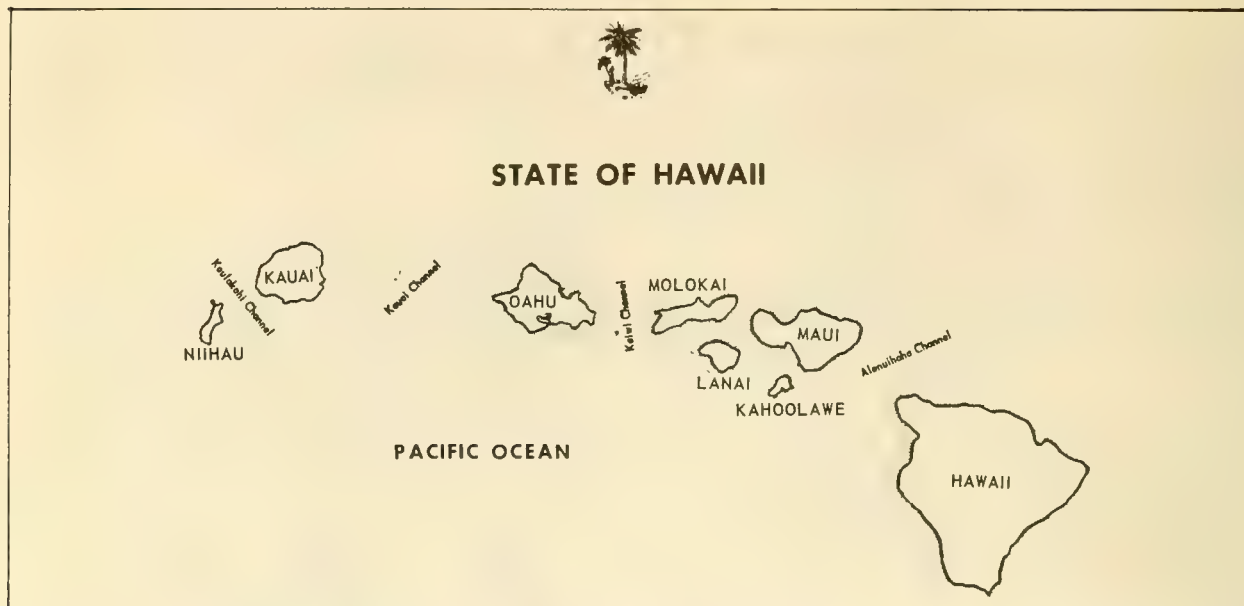


Hawaii tuna catch, 1955-63.

The Hawaiian skipjack catch in 1963 totaled 8.1 million pounds valued at \$1.1 million as compared with the 1962 skipjack catch of 9.4 million pounds valued at \$1.2 million. The Hawaiian big-eyed tuna catch was also down in 1963--948,000 pounds with a value of \$502,000 as compared with the 1962 big-eyed tuna catch of 1.2 million pounds with a value of \$598,000.

The 1963 Hawaiian landings included 385,000 pounds of yellowfin tuna, 401,000 pounds of jack mackerel, 334,000 pounds of striped marlin, 190,000 pounds of black marlin, and 151,000 pounds of big-eyed scad.

Oahu led the Hawaiian Islands in landings during 1963 with 8.7 million pounds or nearly 75 percent of the total. The Island of Hawaii was next with 1.6 million pounds, followed by Maui with 1.2 million pounds. The remainder of the catch was landed at ports in the Islands of Molokai, Kauai, and Lanai.



The 1963 Hawaiian catch was taken by 820 fishermen. Fishing craft operated during the year included 56 vessels (craft of 5 net tons and over), 360 motor boats, and 23 other boats.



Industrial Fishery Products

GROWTH-PROMOTING ABILITY OF FISH SOLUBLES IN CHICK FEED CONFIRMED:

The growth rate of chicks was significantly increased by the addition of condensed fish solubles to basal rations at levels of 3 and 5 percent, according to a summary by British workers of results of their experiments during a period of several years. Rate of growth was increased significantly when solubles were added to an all-vegetable protein ration that met all known requirements except that for the UGF (unidentified growth factor) of fish. Growth likewise was increased significantly when solubles were added to a "more usual chick-rearing mash" containing fish meal at a level of 10 percent. The growth-promoting activity was found to be nearly equally divided between fractions that were soluble in water and other fractions that were not; the latter were separated from diluted fish solubles with a centrifuge. Increase over growth rate on a ration containing only vegetable protein was

6.6 percent and it was even larger when the basal ration contained fish meal at a level of 10 percent.

The fish solubles used were (commercial) good quality condensed herring solubles and, in the trials, the added solubles were substituted for an equal amount of the whole basal ration. The experiments were reported in an issue of *The British Journal of Nutrition* (vol. 18, no. 3, p. 461, 1964). (Technical Advisory Unit, U.S. Bureau of Commercial Fisheries, Boston, Mass., November 4, 1964.)

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UNITED STATES MARINE-ANIMAL OIL TRENDS 1964 AND OUTLOOK FOR 1965:

Summary: The total United States supply of marine-animal oils during calendar year 1965 probably will be smaller than the estimated 420 million pounds for 1964, unless domestic production shows a considerable increase. Beginning stocks on January 1, 1965, were expected to be down from the 168 million pounds of January 1964. With imports forecast at about the same level as in 1964, total available supply will be tied largely to the 1965 industrial catch of the domestic fishery, which will not get into full swing until April or May 1965. Over 90 percent of total domestic marine-animal oils are obtained from the menhaden catch landed along the east and Gulf coasts of the United States.

Production: United States marine-animal oil production in 1964 was estimated at 180 million pounds as compared with 186 million pounds in 1963. Production during January-September 1964 totaled 153 million pounds compared with 154 million pounds for the same period in 1963. Production of marine-animal oils in recent years has declined, due to a drop in the menhaden catch.

Imports: United States marine-animal oil imports in 1965 probably will be near the 1964 estimated total of 75 million pounds, due to a relatively tight world supply. Imports during 1963 totaled 83 million pounds. Whale sperm oil, a special oil valued as a lubricant for fine instruments, accounts for about 80 percent of total marine-animal oil imports, with fish-body oils and fish-liver oils each accounting for around 10 percent.

Exports: United States exports of marine-animal oils (mostly menhaden oil) in 1965 will depend primarily upon domestic production. Should the 1965 menhaden fish catch improve, considerably larger exports are foreseen than the 175 million pounds now estimated for 1964. Exports in 1963 totaled 274 million pounds. If offered at competitive prices, a good market exists for menhaden oil overseas, where it is used largely as an edible oil in the manufacture of margarine, shortening, and other products.

Domestic Consumption: Unless supplies loosen up, factory consumption of marine-animal oils in the United States during 1965 will be down from the 1964 estimated total of 82 million pounds. Total estimated use in 1964 is down 8 percent from 1963 and reflects the increasingly tight supply situation and correspondingly higher prices. United States stocks of marine-animal oil on October 1, 1964, amounted to 147 million pounds, as compared to 182 million pounds on October 1, 1963. Factory use of marine oils during January-September 1964 was down in paint and varnish manufacture, fatty acids, animal feeds, and in lubricant production. Utilization was up, however, for resins and plastics, and other drying-oil uses.

Prices: United States fish oil prices (menhaden oil, crude, in tanks f.o.b. Baltimore) are expected to remain at their currently high levels until (next) spring, when 1965 production prospects become clearer. A steady upward trend has carried menhaden oil prices from 4.0 cents per pound in early 1963 to 9.5 cents in November 1964, the highest since January 1957. Prices for 1964 were expected to average around 8.5 cents per pound. (Fats and Oils Situation, November 1964.)

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U.S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, October 1964: Preliminary data on U.S. production of fish meal, oil, and solubles for October 1964 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production ^{1/} of Fish Meal, Oil, and Solubles by Areas, October 1964 (Preliminary) with Comparisons				
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles (Short Tons)	Homogenized ^{3/}
October 1964:				
East & Gulf				
Coasts	6,683	4,406	3,145	-
West Coast ^{2/}	1,746	678	1,857	-
Total	8,429	5,084	5,002	-
Jan.-Oct. 1964				
Total	193,028	157,901	77,666	-
Jan.-Oct. 1963				
Total	209,670	167,964	83,902	7,224

^{1/}Does not include crab meal, shrimp meal, and liver oils.

^{2/}Includes American Samoa and Puerto Rico.

^{3/}Includes condensed fish.

* * * * *

Production, September 1964: During September 1964, a total of 18.5 million pounds of marine animal oils and 21,671 tons of fish meal was produced in the United States. Compared with September 1963 this was a decrease of 2.6 million pounds of marine animal oils and 2,835 tons of fish meal and scrap. Fish solubles production amounted to 8,227 tons--a decrease of 3,236 tons as compared with September 1963.

Menhaden oil production amounted to 16.8 million pounds--a decrease of 2.2 million pounds. Menhaden fish meal and scrap production in September 1964 amounted to 16,233 tons--a decrease of 3,175 tons as compared with the same month of 1963.

U. S. Production of Fish Meal, Oil, and Solubles, September 1964 ^{1/} with Comparisons					
Product	1/1964	1963	1/1964	1963	Total 1963
	..... (Short Tons)				
Fish Meal and Scrap:					
Herring	1,238	1,318	9,325	6,630	7,537
Menhaden ^{2/}	16,233	19,408	137,205	154,527	181,750
Tuna and mackerel	2,463	2,089	19,891	16,058	26,957
Unclassified	1,737	1,691	18,178	19,904	22,415
Total	21,671	24,506	184,599	197,119	238,659
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	14,793
Grand total meal and scrap	3/	3/	3/	3/	253,452
Fish solubles:					
Menhaden	6,388	8,982	58,142	64,497	74,831
Other	1,839	2,481	14,522	19,898	25,347
Total	8,227	11,463	72,664	84,395	100,178
Homogenized condensed fish	-	90	-	7,224	7,224
	..... (1,000 Pounds)				
Oil, body:					
Herring	218	243	9,737	4,873	5,709
Menhaden ^{2/}	16,818	19,028	133,624	139,900	167,635
Tuna and mackerel	768	1,077	4,061	3,822	5,735
Other (including whale)	742	828	5,395	5,770	6,748
Total oil	18,546	21,176	152,817	154,365	185,827

^{1/}Preliminary data.

^{2/}Includes a small quantity of thread herring.

^{3/}Not available on a monthly basis.

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Major Indicators for U. S. Supply, September 1964: United States production of fish meal in September 1964 was lower by 11.6 percent as compared with September 1963. Production of fish oil was down by 12.4 percent and production of fish solubles decreased 28.8 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, September 1964					
Item and Period	1/1964	1963	1962	1961	1960
	..... (Short Tons)				
Fish Meal:					
Production:					
September	21,671	24,506	31,712	28,800	38,527
January-Sept. 2/	184,599	197,119	249,590	252,274	226,268
Year 3/	-	253,452	312,259	311,265	290,137
Imports:					
September	34,082	35,320	13,698	13,941	9,487
January-Sept.	355,917	304,464	208,694	159,140	97,333
Year	-	383,107	252,307	217,845	131,561
Fish Solubles:					
Production: 4/					
September	8,227	11,553	12,988	11,232	12,523
January-Sept. 2/	72,664	91,619	103,513	93,706	85,316
Year	-	107,402	124,649	112,254	98,929

(Table continued on next page)

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, September 1964 (Contd.)					
Item and Period	1/1964	1963	1962	1961	1960
(Short Tons)					
Imports:					
September	214	225	178	263	38
January-Sept.	3,896	2,994	5,196	2,508	2,832
Year	-	6,773	6,308	6,739	3,174
(1,000 Lbs.)					
Fish Oils:					
Production:					
September	18,546	21,176	31,197	25,174	32,685
January-Sept. 2/	152,817	154,365	207,915	221,109	166,863
Year	-	185,827	250,075	258,118	290,143
Exports:					
September	14,190	22,408	219	9,521	13,959
January-Sept.	120,442	187,012	96,624	95,375	108,778
Year	-	262,342	123,050	122,486	143,659

1/Preliminary.

2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.

4/Includes homogenized fish prior to 1964--none produced in 1964.

* * * * *

U.S. FISH MEAL AND SOLUBLES:

Production and Imports, January-September 1964: Based on domestic production and imports, the United States available supply of fish meal for January-September 1964 amounted to 540,516 short tons--38,933 tons (or 7.8 percent) more than during January-September 1963. Domestic production was 12,520 tons (or 6.4 percent) less, but imports were 51,453 tons (or 16.9 percent) higher than in January-September 1963. Peru continued to lead other countries with shipments of 285,770 tons.

U. S. Supply of Fish Meal and Solubles, January-September 1964 with Comparisons			
Item	Jan.-Sept.		Total 1963
	1/1964	1963	
. . . (Short Tons). . .			
Fish Meal and Scrap:			
Domestic production:			
Menhaden	137,205	154,527	181,750
Tuna and mackerel	19,891	16,058	26,957
Herring	9,325	6,630	7,537
Other	18,178	19,904	37,208
Total production	184,599	197,119	253,452
Imports:			
Canada	42,819	39,535	50,925
Peru	285,770	231,864	291,544
Chile	11,302	22,637	24,249
Norway	-	1,819	1,819
So. Africa Republic	13,087	7,241	12,296
Other countries	2,939	1,368	2,274
Total imports	355,917	304,464	383,107
Available fish meal supply . . .	540,516	501,583	636,559
Fish Solubles:			
Domestic production <u>2/</u>	72,664	3/91,619	3/107,402
Imports:			
Canada	1,226	1,624	2,034
Iceland	-	-	160
So. Africa Republic	935	191	411
Other countries	1,735	1,179	4,168
Total imports	3,896	2,994	6,773
Available fish solubles supply	76,560	94,613	114,175
<u>1/</u> Preliminary. <u>2/</u> 50-percent solids. <u>3/</u> Includes production of homogenized fish.			

1/Preliminary.

2/50-percent solids.

3/Includes production of homogenized fish.

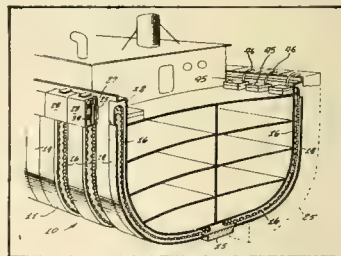
The United States supply of fish solubles during January-September 1964 amounted to 76,560 tons--a decrease of 19.1 percent as compared with the same period in 1963. Domestic production dropped 20.7 percent but imports of fish solubles increased 30.1 percent.



Inventions

NEW SYSTEM TO HELP KEEP DAMAGED VESSELS AFLOAT:

A new safety system for vessels has been patented. To temporarily patch subsurface damage to vessel hulls, the system provides slidable doors which can be moved over the damaged area (Patent No. 3,118,414). To give flotation and buoyancy to damaged vessels, the system provides below waterline flotation chambers which can be positioned by a chain device; additional flotation is provided by air-inflated blankets under each deck (Patent No. 3,122,119). Claims of nonsinkable vessel operation are made for the system when all its features are used. The patents for the system were granted to Robert D. Smith, 2742 E. Tremont Ave., Bronx 61, New York, N.Y. (Products List Circular, Small Business Administration, November 1964.)



Investment Opportunity

TUNA FISHERIES IN RYUKYU ISLANDS:

United States technical and capital participation is being sought by five tuna fishing companies in the Ryukyu Islands. Such a venture would offer a United States investor the advantage of operating in a dollar area under a stable government. United States authorities in the Ryukyus are encouraging the expansion of the tuna industry of the Islands.

Offshore tuna fishing appears to offer the greatest potential for the Ryukyu tuna industry. Tuna canning is another possibility. (As of November 1964, there were no fish canneries in the Ryukyus.)

In September 1964, the Ryukyu tuna fleet had a combined gross tonnage of about 5,500 tons. The Ryukyu Government is interested in licensing new tuna vessels to raise the tonnage of the tuna fleet to 12,000 gross tons by 1969.

In fiscal year 1964, the Ryukyu tuna catch totaled 17,537 metric tons, consisting of 4,970 tons from coastal fishing, 6,904 tons from in-shore operations, and 5,663 tons from off-shore fishing. In fiscal year 1964, the Ryukyu Islands imported marine products (chiefly from Japan) valued at about \$4 million and exported marine products valued at about \$2 million.



Labeling

PENNSYLVANIA ISSUES NEW RULING ON REQUIREMENTS:

A new administrative ruling (Regulation 2504) concerning the prominence, placement, and quantity statements on package labels has been issued by the Pennsylvania Bureau of Standard Weights and Measures. The ruling becomes effective on labels redesigned after January 1, 1965; and to labels prepared from plates made after January 1, 1965; and to all labels after January 1966.



Marketing

EDIBLE FISHERY PRODUCTS, 1964:

The United States catch of food fish in 1964 was expected to decline again. Catches of nearly all of the major species were down--salmon and haddock were notable exceptions. United States fishermen as of October 1964 had landed much less Maine herring, ocean perch, shrimp, halibut, cod, and whiting than in 1963. United States imports of fishery products continued to increase in 1964 and more than offset the lower domestic catch. Imports of Japanese tuna and Canadian frozen groundfish blocks increased sharply during the remainder of the year.

Although supplies of many fishery items were expected to be adequate during the remainder of 1964, some were to become relatively scarce. A few items--salmon and haddock products in particular--were plenti-

ful. Supplies of shrimp, halibut, scallops, and cod were expected to tighten.



View of wholesaler's stand on South Street in the salt-water section of Fulton Fish Market.

The total consumption of fishery products in 1964 increased at about the same rate as population, so little change occurred in the per capita consumption which at 10.7 pounds was up only slightly from the previous year.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U.S. Department of the Interior, and published in the U.S. Department of Agriculture's November 1964 issue of the National Food Situation (NFS-110).



Middle Atlantic States

FISHERIES LANDINGS, 1963:

The 1963 commercial landings of fish and shellfish in the Middle Atlantic States (New York, New Jersey, and Delaware) totaled 487.9 million pounds with a value of \$20.9 million ex-vessel (excluding unclassified trash fish). That was a drop of 46 percent in quantity and 16 percent in value from the previous year due mainly to lower landings of menhaden.

Menhaden 1963 landings in the Middle Atlantic States totaled only 372.9 million pounds with an ex-vessel value of \$4.3 million, compared with 1962 landings of 782.5 million pounds with an ex-vessel value of \$7.9 million.

Substantial declines also occurred during 1963 in Middle Atlantic landings of blue crabs, oysters, and scallops; there were moderate

declines for scup, fluke, whiting, bluefish, butterfish, and cod.

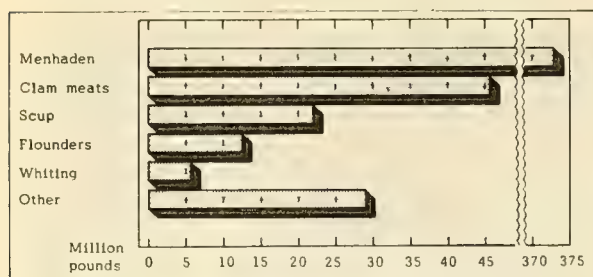


Fig. 1 - Middle Atlantic States catch, 1963.

To offset the decline were increases for tuna landings which rose from 38 tons in 1962 to 2,858 tons, mainly bluefin, in 1963. Landings were also up for surf clams and hard clams, striped bass, sea bass, blackback flounder, and yellowtail flounder.

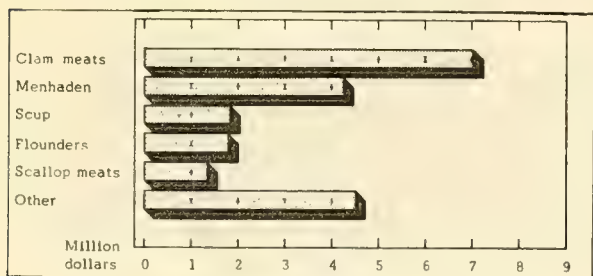


Fig. 2 - Value of Middle Atlantic States catch, 1963.

Of the total 1963 Middle Atlantic landings, New Jersey received 52 percent, New York 27 percent, and Delaware 21 percent. The percentage breakdown by value was New Jersey 50 percent, New York 44 percent, and Delaware 6 percent. The Middle Atlantic catch in 1963 was taken by 8,553 fishermen operating 599 vessels (craft of 5 net tons and over), 4,085 motor boats, and 288 other boats.



New England

FISHERIES LANDINGS, 1963:

The commercial fisheries of the New England States (Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut) in 1963 yielded 829 million pounds of fish and shellfish valued at \$68.3 million ex-vessel. That was a decline from the previous year of 43 million pounds (5 percent), but an increase of \$2.5 million (4 percent).

The 1963 New England catch of groundfish (cod, cusk, haddock, ocean perch, pollock, and white hake) totaled 294.7 million pounds, down 10 percent from 1962. Also well below 1962 landings were menhaden, whiting, and sea scallops. Yellowtail flounder showed the largest increase--up 38 percent for a record New England catch of 78 million pounds in 1963.

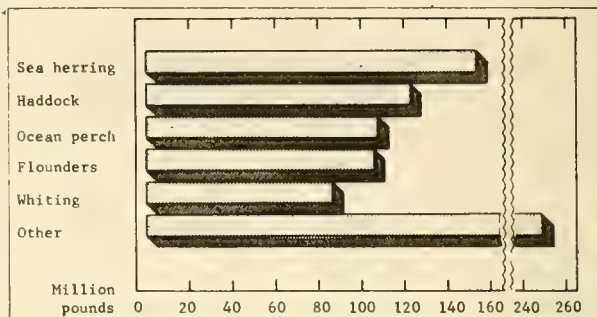


Fig. 1 - New England States catch, 1963.

Average ex-vessel prices for the majority of New England food fish items were higher in 1963 than a year earlier. Shellfish prices were much improved, reflecting to some degree consumer preference for more costly food.

The 1963 landings in each of the New England States, with the exception of New Hampshire, were down from 1962. Massachusetts led in catch with 56 percent of the 1963 New England landings, followed by Maine with 34 percent; Rhode Island 8 percent; and Connecticut and New Hampshire 1 percent each. The catch breakdown by value in 1963 was Massachusetts 60 percent, Maine 31 percent, Rhode Island 6 percent, Connecticut 2 percent, and New Hampshire 1 percent.

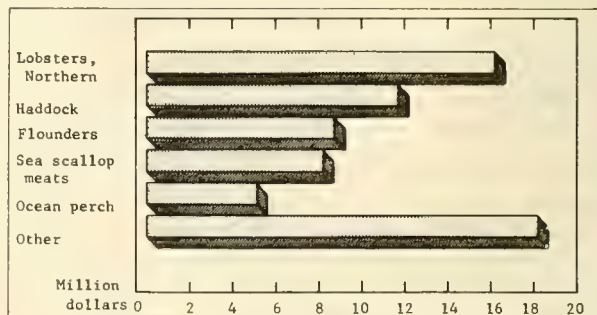


Fig. 2 - Value of New England States catch, 1963.

In 1963, a total of 21,428 fishermen using 733 vessels of 5 net tons or greater and 10,746 other craft operated in the fisheries of the New England area. Compared with the

previous year, that was a gain of 6 vessels, but a decrease of 108 fishermen and 367 other craft.

Manufactured fishery products produced in the New England States in 1963 were valued at \$121.3 million at the processors' level. That was a decline of \$11.7 million from 1962.



North Atlantic Fisheries Investigations

SEA HERRING SURVEY CONDUCTED:

M/V "Delaware" Cruise 64-7 (September 8-12, 1964): The objectives of this cruise were to: (1) sample populations of adult sea herring and to obtain related environmental data, (2) obtain sea herring blood samples, (3) make plankton tests for early fall-spawned herring larvae, and (4) obtain blood samples and measurements from offshore lobsters. The area of operations for these investigations by the U. S. Bureau of Commercial Fisheries research Biological Laboratory, Boothbay Harbor, Me., using the Bureau's exploratory fishing vessel Delaware, was on the Northern Edge of Georges Bank to Cultivator Shoals along the 40-fathom contour line.

During the cruise, 6 otter-trawl sets and 2 gill-net sets were made at stations worked. The trawl sets (45 minutes each) made in waters from 40 to 55 fathoms yielded herring catches ranging from one-quarter to 83 bushels, the average catch per tow being 24 bushels (about 1,800 pounds). The 2 gill-net sets (600 feet of net) for adult herring and sardines yielded a total of three dozen adults. The herring measured from 19.3 to 35.0 centimeters (7.5 to 13.8 inches) long. Preliminary examination indicated that the 1960 year-class contributed about 60 percent of the total samples obtained. During the cruise, 294 herring were sampled for blood which was frozen in liquid nitrogen. No lobsters were obtained.

A total of 19 one-meter net plankton tows of 15-minutes duration (5 minutes at 10 meters or 32.8 feet, 5 minutes at 5 meters or 16.4 feet, and 5 minutes at the surface) were made during the cruise. A total of 41 yolk sac larvae with a mean length of 5.5 millimeters or 0.22 inches (range 4-7 millimeters or 0.12-0.28 inches) were obtained on the northern edge of the Banks.

At trawl sets, gill-net sets, and plankton sets, 5 drift bottles and 5 sea-bed drifters were released. Bathythermograph casts were made, surface salinity samples collected, and weather observations recorded. At the different stations worked the salinity ranged from 32.3 to 33.5 and surface temperatures ranged from 56.1 to 65.0.

Note: See Commercial Fisheries Review, September 1963 p. 35.



North Pacific Fisheries Explorations and Gear Development

NEWLY-DESIGNED

PELAGIC TRAWL TESTED:

M/V "St. Michael" Cruise 4 (October 1-15, 1964): To test the effectiveness of, and determine the catch rate of a lampara trawl was the principal objective of this cruise off the Washington coast near Umatilla by the U.S. Bureau of Commercial Fisheries chartered exploratory fishing vessel St. Michael.

The lampara trawl, developed by the Bureau's exploratory fishing base at Seattle, was built to determine if a trawl with a relatively great horizontal spread and a small vertical opening rigged to fish just off-bottom with conventional otter boards could efficiently catch hake without need of depth-telemetry gear. The spread across the wing tips of the net is about 100 feet, while the height of the body at the forward end is 18 feet. The trawl was designed to fish between 2 and 4 fathoms off the bottom with otter boards in contact with the sea bed.

The secondary objective of the cruise was to determine if the "Cobb" pelagic trawl could be rigged to effectively fish both on the bottom and in midwater by rigging the hydrofoil otter boards near the lower wings of the net. During past cruises, hydrofoil trawl boards were placed 60 fathoms ahead of the trawl with bridles running from each hydrofoil back to the upper and lower wing tips. During this cruise the hydrofoils were rigged as shown in illustration.

The lampara trawl caught less hake per hour than the "Cobb" pelagic trawl. The lampara trawl caught an average of 1,600 pounds of fish an hour, mostly hake, in a total of 17 drags compared to an average of 3,400 pounds

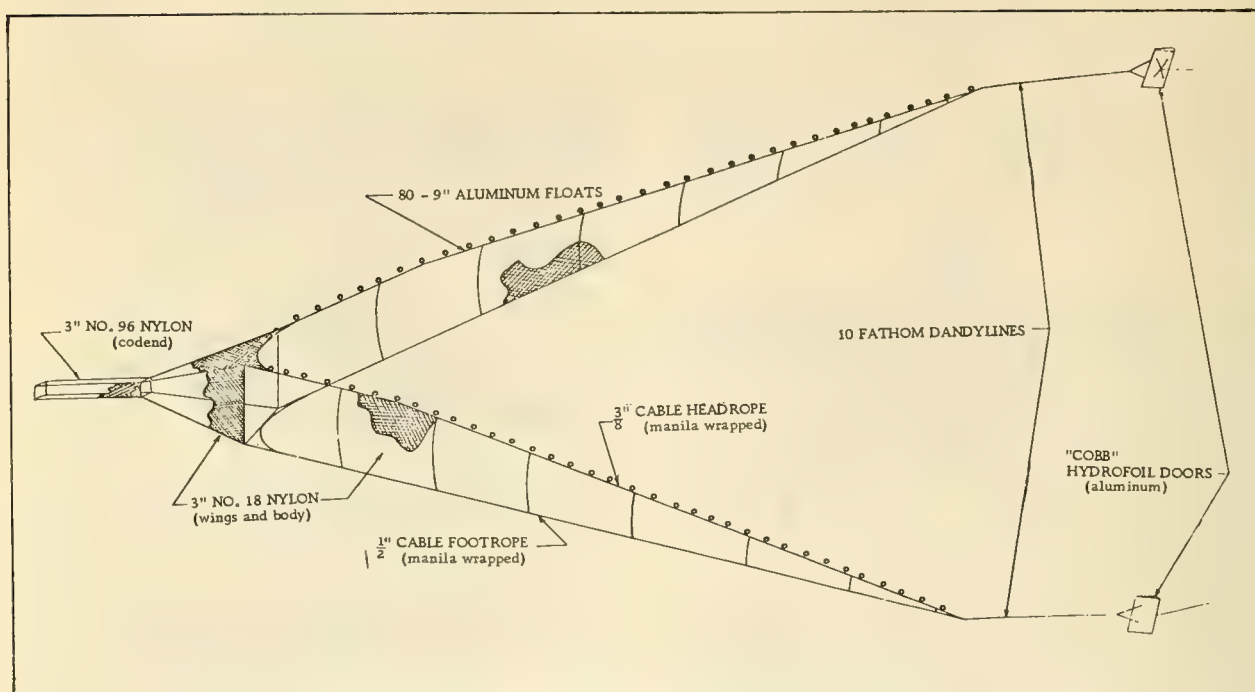


Fig. 1 - Shows lampara trawl tested on St. Michael cruise 4.

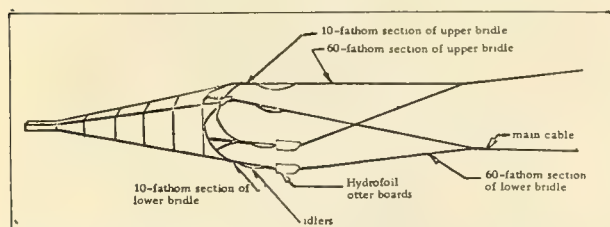


Fig. 2 - Shows "Cobb" pelagic trawl rigged to fish just off-bottom on St. Michael cruise 4.

of fish an hour for the "Cobb" pelagic trawl in a total of 8 drags.

The echo-sounder showed that most fish were not located from 2 to 4 fathoms above the bottom as expected. Most fish were between 4 and 25 fathoms above the bottom. When the lampara trawl was towed with the otter boards on the bottom, the net probably went below most of the fish. When the trawl was tested in midwater, the depth of the net could not be accurately determined and probably wasn't correct to intercept fish during most of the drags. More fish would have been caught with both trawls if an accurate system to determine trawl depth had been used.

During the cruise the lampara trawl was first tested with hydrofoil otter boards. After catching 10,000 pounds of fish in one 60-min-

ute tow, conventional otter-trawl boards were substituted for the hydrofoils. An average of 3,000 pounds of fish per half-hour tow was taken in 3 drags made with the lampara net and conventional otter boards. Examination of the otter-board runners showed that they were not in as firm contact with the bottom as desired. In attempts to improve performance of the otter boards, 16 experimental drags were made in shallow water. After each drag various adjustments were made. In addition to testing light versus heavy otter boards, effects of varying the number of floats on the headrope, varying the amount of trawl cable used, and varying the altitude of the otter boards were examined. But after 16 drags, the otter boards still were not in proper contact with the bottom. Therefore, all further tests of the lampara net were made with hydrofoil boards.

In an attempt to determine trawl depth, a wireless depth telemeter was used. Although the wireless depth telemeter gave accurate readings in calm water at reduced throttle speeds, no useful depth readings were obtained under normal fishing conditions.

An additional 8 drags were made with the lampara net and hydrofoil otter boards. Those

drags caught few fish, the best drag yielding only 1,300 pounds in a 1-hour tow.

The last eight drags were made with the "Cobb" pelagic trawl and the hydrofoil boards. Those drags were more productive, catching an average of 3,400 pounds of fish in each 1-hour tow.

Almost all hake were found in surface to bottom depths of 25 to 65 fathoms. They occurred from the bottom to 40 fathoms above the bottom, with largest concentrations between 4 and 25 fathoms above the bottom. The average length of hake caught during the cruise was about 58 centimeters (22.8 inches). Herring and euphausiids were commonly found in the stomachs.

Note: See Commercial Fisheries Review, December 1964 p. 54.



Oceanography

CONFERENCE HELD ON DYNAMICS OF AIR-SEA CURRENTS:

A Conference on the Dynamics of the Air-Sea Interface, sponsored by the National Science Foundation, was held November 22-25, 1964, at the Institute of Marine Science, University of Miami, Miami, Fla. The conference was attended by leading oceanographers from all over the United States.

A thorough knowledge of the sea's surface, as a meeting place of air and water currents, is considered important in the designing of sailboats and hydrofoil craft. The conference discussed the operation and behavior of such craft under varying sea conditions, as well as the new "air-bubble" type of craft, which ride just above the water on a cushion of air.

Other sessions were in connection with the effects of ocean waves on anchored buoys. In scientific studies of underwater sound--currently one of the most vital research programs now under way at the Miami Institute of Marine Science and at other oceanographic institutions--a virtually immovable but floating platform is often required to house delicate instruments for precise measurements. Giant manned buoys that move no more than a few inches in 20-foot waves have been designed.

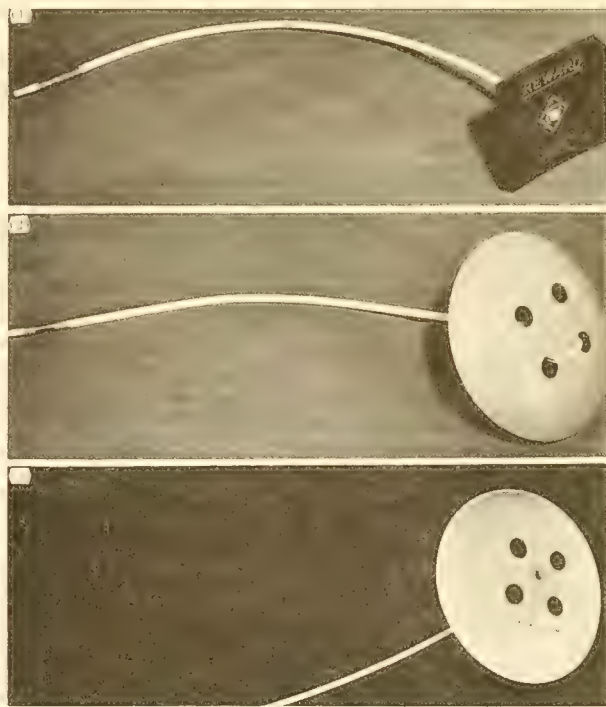
The effect of waves, currents, and winds upon all anchored vessels is considered great. Recently a special ship was designed to act as a drifting platform for the MOHOLE (sea-floor drilling) project, which proposes to lower drilling equipment to the bottom of the

sea and drill a hole 3 miles deep into the sea-floor. That important project, and the special devices and techniques needed to complete it successfully, also was discussed at the conference. (Press release, Institute of Marine Science, University of Miami, Miami, Fla., November 11, 1964.)

* * * * *

"SEA-BED DRIFTERS" AID IN STUDYING WATER CURRENTS:

In recent years oceanographers have been making increasing use of drifting plastic objects known as "sea-bed drifters," in order to obtain information about the movements of the water near the seabed. The drifters are released in batches at certain points in the sea and trail over the seabed, later to be recaptured in the nets of fishermen, or by skin divers, or to be washed ashore and found by the public. Rewards are offered for their recovery and return with details of the position and date of finding. The study of that information enables the oceanographer to construct a picture of the currents near the seabed.



(1) The Craig sea-bed drifter. (2) The Woodhead sea-bed drifter as used by British scientists. (3) The Woodhead sea-bed drifter as used by United States scientists.

Glass bottom-trailing drift bottles with metal wire "tails" were used in European waters at various times from 1904 to 1939 and in United States waters in 1960 and 1961. The plastic sea-bed drifter was first conceived by R. E. Craig of the Marine Laboratory, Aberdeen, Scotland. The present version of it consists of a black plastic square measuring 11.3 x 11.3 centimeters (about 4 x 4 inches), with a reward notice in English in-laid in red. The time and place of release are indicated by a series of punch marks around the edge of the square. Through the middle of the square is fitted a white plastic rod, or "tail" (about 54 centimeters or 21 inches long and 0.65 centimeters

in diameter). This has a small copper weight attached near its lower end, so that the drifter has a slight negative buoyancy and moves over the seabed with its tail just touching the bottom.

The drifter most commonly in use at present was developed by P. M. J. Woodhead of the Fisheries Laboratory, Lowestoft, England. It resembles a toadstool and has a white polythene rod identical with that now used in the Craig drifter, but instead of a black plate it has a red polyethylene saucer of 18.5 centimeters (7.3 inches) diameter. The rod is sharpened to a point at its lower end with a 6-centimeter (2.4-inch) copper ferrule above it; the red saucer has four 2-centimeter (0.8-inch) holes at a distance of 8 centimeters (3.2 inches) from its center. The version used by the Lowestoft Laboratory bears instructions to the finder on the saucer in English, French, and German, and provision has been made so that additional languages can be used if required. A serially numbered yellow polyvinyl chloride tag is secured to the saucer and this bears a reward notice in the English language only.

In Canada and the United States the Woodhead version of the sea-bed drifter is used. The United States sea-bed drifters have a red stem and a yellow saucer, with the serially numbered return labels and instructions in English stuck to the saucer. The Canadian sea-bed drifters have a red saucer and a white rod, with a serially numbered yellow "spaghetti" tag, similar to a fish tag, secured to the saucer for identification and return instruction purposes. The only printing on the spaghetti tag is: "Reward, Ret. Fish. Res. Board St. Andrews, N.B. S-05391."

The Craig type of drifter has been extensively used off the east and west coasts of Scotland, and English workers have made a number of large-scale releases of the Woodhead type in the North Sea and Irish Sea. The rate of recovery of the latter type in the North Sea has been up to 50 percent in 12 months. Releases of Woodhead drifters have also been made off the northwest coast of Norway and in the southeastern Barents Sea. Belgian scientists have now started to use this type of drifter in the southern North Sea. In North American waters the Woodhead type has been released by United States scientists over all parts of the Continental Shelf from the Nova Scotia Banks to Florida. Starting in 1961, sea-bed drifters have been released by Canadian workers on the shelf along the Canadian Atlantic coast from the Bay of Fundy to the Gulf of St. Lawrence. Recently emphasis has been given to simultaneous releases of the sea-bed drifters and drift bottles. The rate of recovery by trawlers from releases made on the Nova Scotian Shelf is of the order of 5 to 6 percent. In 1963, a total of 2,700 sea-bed drifters was released there.

The success of investigations with sea-bed drifters depends very largely on the fishermen and the public who find them. The greater the number of drifters which are returned with accurate details of the positions and dates of their recapture, then the greater is the information available to the oceanographer and the more reliable are his deductions about currents. The active cooperation of fishermen is earnestly requested by all those marine scientists who make use of this particular instrument. (Presented as Document No. 35 to the 14th Annual Meeting of the International Commission for the Northwest Atlantic Fisheries, Hamburg, June 1964.)

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DEEP-DIVING SUBMARINE TESTED IN TRIAL DIVES:

The Alvin, a 22-foot oceanographic research submarine designed for ocean deep-diving, was commissioned June 5, 1964, by the Woods Hole Oceanographic Institution, Woods Hole, Mass. After being commissioned, the submarine underwent a long series of tests in local waters around Woods Hole. Tests consisted of short, shallow dives lasting from 1 to 2 hours each in 70 feet of water or less. The purpose of the dives was to teach the pilots how to operate the craft, and to indoctrinate the Institution's scientists in its capabilities when it becomes fully operational.



Fig. 1 - Preparing to lower Alvin into the water.

The Alvin underwent a careful part-by-part inspection in the fall of 1964 in order to uncover any existing weak points in her systems and to find out if there were any areas of critical corrosion or undue wear. Final installation was scheduled of instruments such as lights, cameras, depth recorders, etc. ⁵
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Fig. 2 - Shows Alvin being lowered into the water but not yet waterborne.

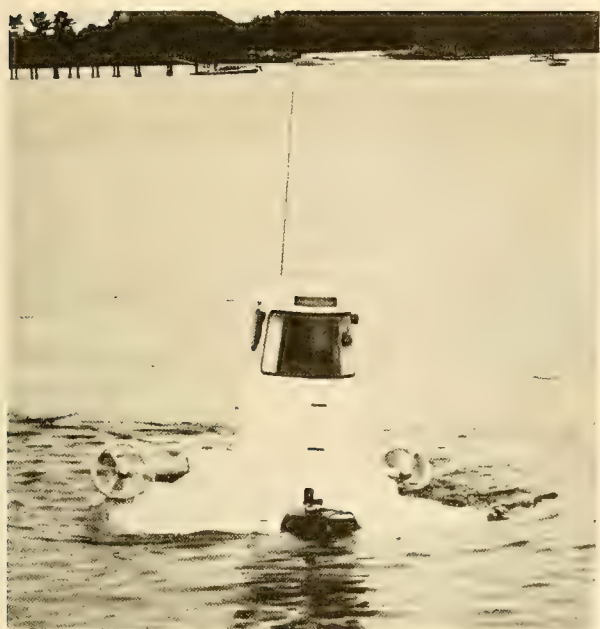


Fig. 3 - Shows Alvin under way on the water's surface.

When completely ready, the Alvin was scheduled to head south for deep-diving in warmer and clearer water. It was expected this would probably be during early 1965 in the Bahamas where she would undergo diving tests down to 6,000 feet. After all tests have proved successful the Alvin will be turned over to the Institution for use on its research programs.

Note: See Commercial Fisheries Review, August 1964 p. 36; April 1964 p. 25.

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GULF OF GUINEA SURVEYED BY RESEARCH VESSEL "GERONIMO":

Data collected during a 4-month voyage in the South Atlantic by the oceanographic research vessel Geronimo was to be analyzed by scientists of the U.S. Bureau of Commercial Fisheries and the University of Columbia, announced the Department of the Interior, November 17, 1964. The vessel is operated by the Bureau's Biological Laboratory, Washington, D.C. The primary objective of the survey was to obtain new information which would benefit the fisheries of Senegal, Nigeria, Sierra Leone, and the Ivory Coast, countries which cooperated in the study. According to the Bureau's laboratory director, the information obtained is expected to add materially

to knowledge of the fishery potential in the Gulf of Guinea, and the permanence of a new ocean undercurrent which was discovered on a previous cruise by the Geronimo.

Presence of the newly discovered undercurrent was first indicated in the summer of 1962. Equipment lowered from the vessel into the easterly flowing Guinea current was suddenly pulled to the west. A current meter used during the Geronimo's latest voyage indicated the continued presence of the undercurrent, but since both observations were made in similar weather, the scientists now want to study it during another season to determine its permanence. This will be done during the Geronimo's next trip to the Gulf of Guinea scheduled for January 1965.

Six scientists of the U. S. Bureau of Commercial Fisheries, who made the entire voyage, were joined for portions of the survey by 3 University of Columbia scientists, as well as other Bureau personnel. The University oceanographers were to analyze the data concerning the Guinea undercurrent. A representative of the U. S. National Museum was also aboard the vessel for a portion of the trip to observe bird life.

Note: See Commercial Fisheries Review, November 1964 p. 57; July 1964 p. 24; April 1964 p. 47.



Oregon

SILVER SALMON TRANSPLANTS MAY HELP BUILD RUNS IN WILLAMETTE RIVER SYSTEM:

Successful spawning by transplanted adult silver salmon in the Willamette River system was revealed by stream surveys in late 1964 by Oregon Fish Commission biologists. The surveys were a followup on 6,800 surplus silver salmon distributed from the Oregon Cascade Hatchery into 13 tributaries of the Willamette River. The transplanting program is an experiment since the new waters were not the natal streams of the fish. The surveys confirmed the hopes of biologists that the female fish, gravid with eggs, would spawn in the new environment. Some attempts in the past to transplant adults that were less "ripe" have resulted in the fish moving back downstream, apparently in search of their home waters.

The strong tendency of adult salmon to return to their stream of origin can work against

the expansion of spawning populations. Suitable tributaries with few or no salmon have little chance to develop large runs. Transplanting surplus adult salmon seems to offer a good opportunity to establish production in such areas.

Optimism for the survival and return of the offspring of the salmon transplanted in Willamette River waters is especially high because of the pending construction of the new \$2 million fishway at Willamette Falls, long a barrier to the upstream migration of the species. The fishway's 1966 completion date should accommodate 1964-spawned salmon when they return in 1967 as spawning adult salmon.

Well over 900 redds or spawning nests were observed in the 39 miles of stream covered in the sample appraisal. That was only a small portion of the potential incubation area available in the streams where the fish were released. Spawning silvers were observed as far as 19 miles upstream from the original point of release, and redds were also found in over a dozen smaller tributaries of the streams in which the plants were first made. Further investigations will be conducted in the spring and summer of 1965 to determine the relative success of egg incubation and juvenile rearing.

The transplants of silver salmon in the Willamette River tributaries were only a part of the massive movement of over 25,000 excess adult silver salmon available in 1964 at Oregon Fish Commission hatcheries. The ripe fish, both male and female, were transported to various Oregon release sites stretching from the northeast corner of the State to south coast streams. The effort to develop new silver runs in Oregon has involved some 16 major river systems. In late 1964, the transplanting program was still under way at Oregon Fish Commission coastal hatcheries where late-arriving silver salmon were swamping hatchery facilities. (Oregon Fish Commission, November 19, 1964.)

Note: See Commercial Fisheries Review, Dec. 1964 p. 56.



Oysters

MARYLAND OBSERVATIONS FOR 1964:

Spatfall in 1964: Spatfall in the summer of 1964, as measured by the use of the transite

plates, appears to have been a success in most Maryland areas, although it was not up to the exceptional levels of last year. This method of monitoring the setting pattern only indicates the period when the larval oysters in any given area are attaching themselves to the cultch, and not the number able to survive.

A survey that was to be commenced late in the fall of 1964 under the auspices of the Department of Chesapeake Bay Affairs with the cooperation of the Chesapeake Biological Laboratory was expected to produce some evidence of the number of surviving spat in representative areas.

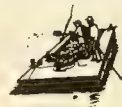
A valid picture of the setting pattern in Maryland's oyster-producing areas can be obtained only if the monitoring program is begun early enough in the spring and ended late enough in the fall to measure all of the waves of setting.

The last station to receive any set was the County Seed Area in Piney Island Swash, at which a single spat was collected during the week of September 17-23. Setting in the other areas had ended by that time. In the seed areas, such as the upper St. Marys River, parts of Eastern Bay, and Broad Creek, strong waves of setting were recorded, and much good seed was probably produced. Just how well the young oysters fared can only be ascertained by a systematic sampling of bottom material, carried out after the spat have grown large enough to be easily seen.

The setting pattern in the Tred Avon River, Irish Creek, Broad Creek, and Harris Creek was monitored by personnel from the U. S. Bureau of Commercial Fisheries Laboratory at Oxford, Md.

Notes: (1) For more detailed data write to Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. ("Final Report of Maryland Oyster Observations for 1964," Bulletin No. 2, Oct. 20, 1964.)

(2) See Commercial Fisheries Review, Oct. 1964 p. 34.



Pacific Marine Fisheries Commission

ANNUAL MEETING HELD:

The annual meeting of the Pacific Marine Fisheries Commission was held November 18-20, 1964, in San Francisco, Calif. The

meeting was open to the public, and this year was headed by the Director of the California Department of Fish and Game, who presided as chairman.

The Commission is composed of members from the States of Washington, Oregon, Idaho, and California. It is dedicated to the coordination of research among member states to prevent duplication, the adoption of common managerial principles and practices, and the protection of ocean and anadromous resources. The four member States draft and recommend legislation to their respective states, consult with and advise their appropriate state administrative agencies on problems connected with fisheries, and recommend the adoption of regulations they deem advisable.

Included on the agenda of this year's meeting were status reports on five important ocean fisheries--crab, shrimp, groundfish, albacore, and salmon; presentation of technical papers; and resolutions recommending ways to solve mutual problems.



Salmon

PACIFIC NORTHWEST CANNED STOCKS, NOVEMBER 1, 1964:

Canners' stocks of Pacific Northwest canned salmon of 4,032,400 actual cases on November 1, 1964, in the United States were 270,768 cases less than stocks on hand October 1, 1964. Pink salmon made up 52.3 percent (2.1 million cases, mostly 1-lb. talls) of the total canners' stocks, followed by chums

Table 1 - Total Canners' Stocks of Pacific Northwest Canned Salmon, November 1, 1964

Species	Nov. 1, 1964	Oct. 1, 1964
	(No. of Actual Cases)	
King	104,399	134,337
Red	750,438	856,770
Coho	250,162	230,519
Pink	2,109,841	2,218,068
Chum	817,515	863,474
U. S. Total	4,032,400	4,303,168

(818,000 cases, mostly 1-lb. talls), and reds (750,000 cases). The remainder of about 9 percent consisted of coho and king salmon. About 78 percent of the pink salmon stocks on hand was 48 1-lb. cans, and the balance mostly 48 $\frac{1}{2}$ -lb. cans.

From October 1 to November 1, 1964, pink salmon stocks were lower by 108,227 cases, reds were down 106,287 cases, and chums were down 45,959 cases.

Carryover stocks at the canners' level amounted to 1,175,588 standard cases on July 1, 1964, which is the approximate opening date of the Pacific Northwest salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply this season to 5,097,944 standard cases.

Shipments at the canners' level July 1, 1964, to November 1, 1964, totaled 2,326,476 actual cases.

Information on canned salmon stocks is based on reports from canners who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, November 28, 1964.)

Table 2 - Total Canners' Stocks on hand November 1, 1964 (Sold and Unsold), by Species & Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48/ $\frac{1}{4}$ -lb.	14,192	146,307	70,869	7,469	1,072	239,909
48/ $\frac{1}{2}$ -lb.	77,980	340,344	46,816	385,562	109,808	960,510
48/1-lb.	11,915	260,969	117,812	1,648,134	676,690	2,715,520
12/4-lb.	312	2,863	14,665	68,676	29,945	116,461
Total	104,399	750,483	250,162	2,109,841	817,515	4,032,400

Table 3 - Canners' Shipments July 1, 1964-November 1, 1964, by Species & Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48/ $\frac{1}{4}$ -lb.	10,055	281,625	51,823	4,212	372	348,087
48/ $\frac{1}{2}$ -lb.	58,862	346,750	7,559	217,906	48,283	679,360
48/1-lb.	10,206	237,085	50,697	749,790	201,917	1,249,695
12/4-lb.	104	2,087	6,825	30,721	9,597	49,334
Total	79,227	867,547	116,904	1,002,629	260,169	2,326,476

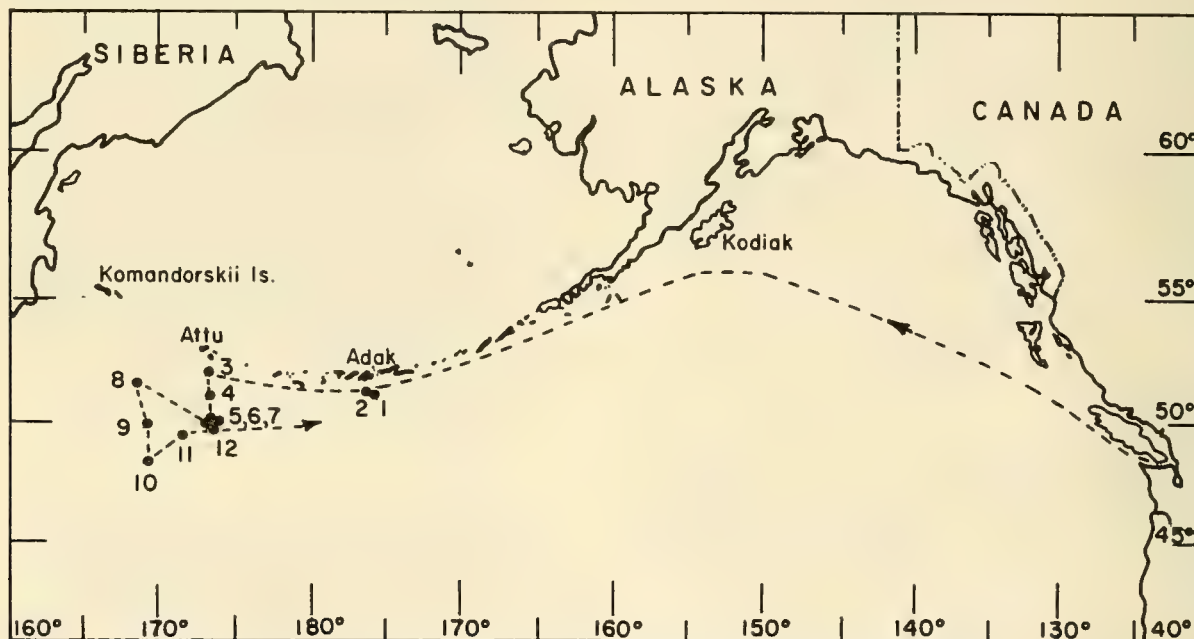
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SALMON RESEARCH CRUISE IN THE WESTERN NORTH PACIFIC:

A salmon research cruise in the western North Pacific Ocean by the U. S. Bureau of Commercial Fisheries research vessel George B. Kelez ended on October 22, 1964, after a 2-month (6,500-mile) trip. The vessel fished stations south of the Aleutian Islands from Adak to the Komandorskii Islands.

Catch results showed that immature sockeye and chum salmon generally were more abundant in the western North Pacific, south of Attu and Komandorskii Island, than in the Adak area.

during autumn the greatest number of salmon taken in gill nets are caught between 8 p.m. and 11 p.m., with the least number between the hours of 11 p.m. to 2 a.m. About equal numbers of salmon were taken between 2 a.m. to 5 a.m. and 5 a.m. to 8 a.m. Other preliminary results indicated that the catch in gill nets fished continuously throughout the night was less than the cumulative catch in gill nets fished for short intervals during the night. The results indicate that dropouts may occur from gill nets and that Bureau scientists may have a way of measuring this possible source of mortality.



Cruise track and fishing stations of R/V George B. Kelez, August 20–October 22, 1964.

In a comparative gear study, crew members set and hauled about $1\frac{1}{2}$ miles each of gill nets and long lines in simultaneous fishing experiments. Biological data of the salmon catches will be compared to determine the selective features of the two forms of gear.

To study the question of gill-net dropouts, Bureau personnel devised a sampling method in which units of gear were set, hauled, and reset at intervals throughout the night. Preliminary results indicate that on the high seas

In addition to obtaining data at sea on salmon lengths, catch by mesh size, and scale samples for age determination of fish, whole frozen fish were brought back to the laboratory for detailed study of the specimens. Studies will be made to determine the country and river of origin of those salmon from the western Pacific.

--By Robert R. French,
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Biological Laboratory,
U. S. Bureau of Commercial Fisheries,
Seattle, Wash.



U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 725

Shrimp

BREADED PRODUCTION, JULY-SEPTEMBER 1964:

United States production of breaded shrimp amounted to 21.6 million pounds during the third quarter of 1964, according to preliminary data.

The Gulf States ranked first in the production of breaded shrimp with 12.7 million pounds. Breaded shrimp production during January-September 1964 amounted to 60.8 million pounds.

Table 1 - U. S. Production of Breaded Shrimp by Months, July-September 1964	
Month	Total 1,000 Lbs.
July	8,053
August	6,626
September	6,913
Total 3rd Qtr. 1964 1/	21,592
Total 3rd Qtr. 1963	2/
Total 1st 9 mos. 1964	60,800
Total 1st 9 mos. 1963	2/
Total 1963	75,039
1/ Preliminary. 2/ Not available	

Table 2 - U. S. Production of Breaded Shrimp by Areas, July-September 1964					
Area	Plants No.	July	August	September	Total
		(1,000 Lbs.)			
Atlantic States	14	2,281	2,281	2,296	6,858
Gulf States	21	5,032	3,728	3,930	12,690
Pacific States	8	740	617	687	2,044
Total	43	8,053	6,626	6,913	21,592

Table 3 - U. S. Production of Breaded Shrimp by Months, 1964 and 1963		
Month	1/1964	1963
	(1,000 Lbs.)	
January	6,936	2/
February	7,498	2/
March	6,706	2/
April	6,353	2/
May	5,558	2/
June	6,157	2/
July	8,053	2/
August	6,626	2/
September	6,913	2/
October	-	7,390
November	-	6,129
December	-	5,513
Total		75,039
1/ Preliminary. 2/ Not available		



South Atlantic Fisheries Explorations and Gear Development

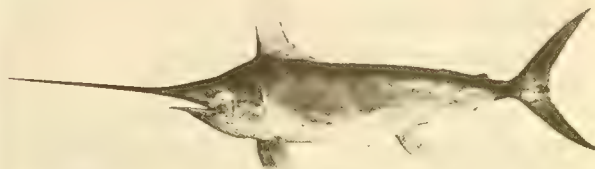
LONG-LINING FOR SWORDFISH IN SOUTH ATLANTIC TESTED:

M/V "Oregon" Cruise 93 (July 15-August 7, 1964): To assess the availability of sword-

fish (*Xiphias gladius*) to long-line gear in the Gulf Stream System off the coasts of North Carolina and South Carolina was the objective of this 24-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

Thirteen long-line sets (12 night and 1 day) consisting of a total of 6,300 hooks were conducted in the area covered. A unit of gear was composed of 138 fathoms of mainline, 3 fathoms of branchline and 1 fathom of leader. Buoy drops varied from 1 to 30 fathoms. Baits used were frozen herring (*Clupea*), cigarfish (*Decapterus*), and menhaden (*Brevoortia*). Herring had the highest percentage of loss per hook (49.5 percent) as compared to the cigarfish (18 percent) and menhaden (12 percent).

Only 3 swordfish were taken during the cruise--1 each off Cape Hatteras (1,000 fathoms), Cape Lookout (100 fathoms), and Cape Romain (500 fathoms). The fish from off Cape Hatteras measured 200 centimeters (about 79 inches) and weighed 68 pounds. The swordfish from the other two stations were badly mutilated by sharks, but their live weights were estimated to be from about 110 to 125 pounds each.



Swordfish (*Xiphias gladius*).

One set along the 500-fathom isobath off Cape Lookout, N. C., yielded 4 big-eyed tuna (*Thunnus obesus*). Their weights ranged from 170 to about 280 pounds. Other bony fish species taken on long-line gear included: yellowfin tuna (*Thunnus albacares*), skipjack (*Katsuwonus pelamis*), blue marlin (*Makaira nigricans*), white marlin (*Tetrapterus albidus*), dolphin (*Coryphaena hippurus*), lancetfish (*Alepisaurus* sp.), the gempylid (*Lepidocybium flavobrunneum*), and wahoo (*Acanthocybium solanderi*).

Long-line sets near the edge of the Continental Shelf along the 100-fathom isobath resulted in heavy catches of sharks. The

silky shark (Carcharhinus falciformis) was the dominant species in that area; 94 captures were made at 4 stations. Other species of sharks caught at the same stations included hammerhead (Sphyrna diplanata), dusky (Carcharhinus obscurus), mako (Isurus oxyrinchus), and thresher (Alopias superciliosus).

In addition to long-lining activities, trolling lines were fished while steaming between stations. Fish caught on this gear were 9 dolphin, 3 king mackerel (Scomberomorus cavalla), 2 skipjack tuna, and 1 false albacore (Euthynnus alleteratus). No surface fish schools were seen during the entire cruise.

After setting the long-line gear at night, dip-net stations were made using a 500-watt incandescent light suspended over the water surface. Six surface nekton ring-net stations were occupied during setting and hauling of the long-line gear. One larval swordfish was taken with that gear at the 1,000-fathom curve off Cape Romain at night where the surface water temperature was 83° F. All specimens taken at the light-attraction and nekton ring net stations were preserved by U. S. Bureau of Commercial Fisheries biologists for future identification and study.



Species Identification

NEW METHOD RECOMMENDED FOR ADOPTION:

A quick, positive method to identify the species source of the meat in processed fishery products has for some years been under development by the U. S. Food and Drug Administration (FDA). Using electrophoretic principles--a technique in which water-soluble proteins separate qualitatively into band patterns which can be made clearly visible by staining and, like fingerprints, are distinctive for each species of fish--the FDA has developed a "starch-gel" method of fish species identification which has been published as a first action in the Methods of Analysis of the Association of Official Agricultural Chemists. If, after analysis by three collaborating laboratories, the method is accepted by that Association as an official final action, it will be the first official chemical technique for making species identification in processed fishery products. The U. S. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Mass.,

was one of the three collaborating laboratories in this important study, and their analysis has been sent to FDA for evaluation.

A referee committee of the Association reviewed the final results of the collaborative study and recommended that the "starch gel" electrophoretic method be officially adopted. The results of the study were to be published in the Journal of the Association of Official Agricultural Chemists.



Sport Fish

NEW RESEARCH VESSEL "DOLPHIN" TO STUDY COASTAL GAME FISH RESOURCES:

The U. S. Bureau of Sport Fisheries and Wildlife new research vessel, the Dolphin, a converted Army tug, and first of the Bureau's research vessels to be assigned to coastal exploration of game fish resources, was commissioned at the Sandy Hook Marine Laboratory, Highlands N. J., on October 14, 1964.



Bureau of Sport Fisheries and Wildlife research vessel Dolphin.

The 400-ton, steel-hulled Dolphin is 107 feet long and is powered by a 1,200-horsepower Diesel engine. It cruises at 11 knots and can accommodate a party of 16. Equipped with research and navigational aids--radar, two bathythermograph electric winches, trawling winches, radio-navigation system, fish-finder, and portable fish tanks--the vessel is a floating laboratory. It will further game fish research by enabling fishery biologists and oceanographers to conduct exploratory fishing studies, collect marine specimens, and carry on other field research.

The Dolphin was constructed in 1953 in West Wago, La.



U. S. Fishing Vessels

NEW SWORDFISH LONG-LINING VESSELS:

In November 1964, a Rhode Island shipyard delivered the new swordfish long-lining vessel Chilmark Voyager to her Massachusetts owners. The new 83-foot vessel, together with her sistership, the Chilmark Sword (delivered in September 1964), began working out of New Bedford, Mass.



Fig. 1 - New swordfish long-lining vessel Chilmark Sword.

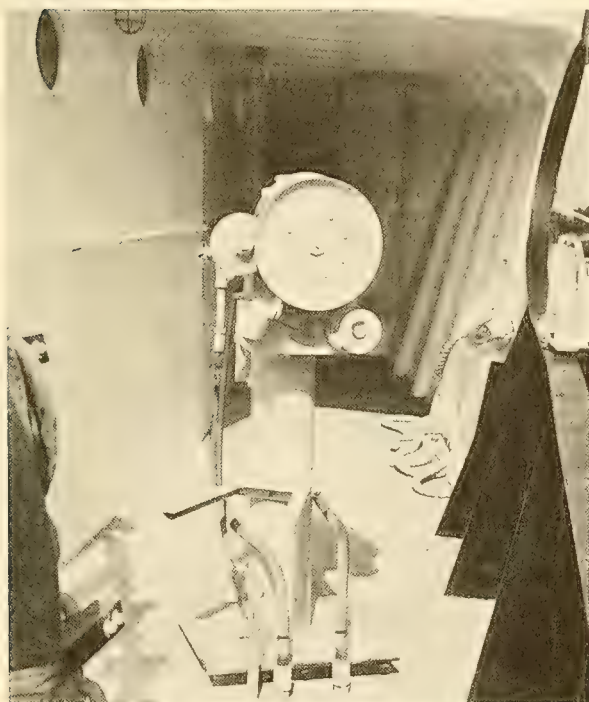


Fig. 2 - Hydraulic line-hauler used aboard Chilmark Sword and Chilmark Voyager.

On her first long-lining trip, the Chilmark Sword returned to New Bedford with 283 swordfish. The quality of the fish was enhanced by the 4-inch plastic insulation in the vessel's plywood-fiberglass hold (3,200-cubic-foot capacity). It was difficult to tell the first of the catch from the last fish taken aboard, according to the skipper of the vessel.

The Chilmark Sword and the Chilmark Voyager are designed for swordfish long-lining on a year-round basis. But they can be quickly converted to stern-trawling. Each vessel is powered by a 460-horsepower Diesel engine driving a 60-inch 4-blade propeller. The vessels carry radar, radiotelephone, and echo-sounding equipment.

Note: See Commercial Fisheries Review, Dec. 1964 p. 64.

* * * * *

DOCUMENTATIONS ISSUED AND CANCELLED:

September 1964: During September 1964, a total of 34 vessels of 5 net tons and over were issued first documents as fishing craft, as compared with 45 in September 1963. There were 39 documents cancelled for fishing vessels in September 1964, as compared with 22 in September 1963.

Table 1 - U. S. Fishing Vessels 1/--Documentations Issued and Cancelled, by Areas, September 1964 with Comparisons					
Area (Home Port)	September		Jan.-Sept.		Total
	1964	1963	1964	1963	
	(Number)				
<u>Issued first documents 2/:</u>					
New England	2	1	26	18	23
Middle Atlantic	2	1	8	16	18
Chesapeake	1	8	27	45	66
South Atlantic	2	8	37	59	77
Gulf	18	24	182	194	239
Pacific	9	3	123	146	160
Great Lakes	-	-	1	4	5
Hawaii	-	-	1	-	-
Puerto Rico	-	-	1	2	2
Total	34	45	406	484	590
<u>Removed from documentation 3/:</u>					
New England	6	-	29	38	48
Middle Atlantic	3	1	14	42	47
Chesapeake	3	3	15	16	25
South Atlantic	8	2	27	45	53
Gulf	6	9	56	87	118
Pacific	11	3	107	68	87
Great Lakes	2	2	9	13	15
Hawaii	-	2	-	3	3
Total	39	22	257	312	396
Note: For explanation of footnotes, see table 4.					

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, September 1964 2/							
Length in feet	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Total
	(Number)						
27-27.9	-	-	-	-	-	1	1
28-28.9	-	-	-	-	-	1	1
31-31.9	-	-	-	-	1	2	3
32-32.9	1	-	-	-	-	-	1
33-33.9	-	-	-	-	1	-	1
34-34.9	-	-	-	-	1	1	2
37-37.9	-	-	-	-	-	1	1

(Table continued on next page.)

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, September 1964 2/ (Contd.)

Length in feet	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
				(Number)			
38-38.9	-	-	1	-	-	-	1
40-40.9	-	1	-	-	-	1	2
42-42.9	-	-	-	-	2	-	2
45-45.9	-	-	-	-	1	-	1
47-47.9	-	-	-	-	-	1	1
49-49.9	-	-	-	-	2	-	2
54-54.9	-	-	-	1	-	-	1
59-59.9	-	-	-	-	-	1	1
60-60.9	-	-	-	-	1	-	1
63-63.9	-	-	-	-	1	-	1
64-64.9	-	1	-	-	2	-	3
65-65.9	-	-	-	1	5	-	6
66-66.9	-	-	-	-	1	-	1
70-70.9	1	-	-	-	-	-	1
Total	2	2	1	2	18	9	34

Note: For explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, September 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
				(Number)			
5-9	1	-	-	-	-	-	2
10-19	-	1	1	-	6	5	13
20-29	-	-	-	-	-	1	1
30-39	-	-	-	-	2	1	3
40-49	-	-	-	1	-	1	2
50-59	-	-	-	-	1	-	1
60-69	-	-	-	1	1	-	2
70-79	-	-	-	-	5	-	5
80-89	-	-	-	-	2	-	2
90-99	1	-	-	-	-	-	1
100-109	-	-	-	-	1	-	1
110-119	-	1	-	-	-	-	1
Total	2	2	1	2	18	9	34

Note: For explanation of footnotes, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, September 1964 2/

Horsepower	New England	Middle Atlantic	Chesapeake	South Atlantic	Gulf	Pacific	Total
				(Number)			
110-119	-	-	1	-	-	1	2
120	-	-	-	-	-	1	1
130-139	1	-	-	-	2	3	6
145	-	-	-	-	-	1	1
150	-	-	-	-	-	1	1
160-169	-	-	-	-	3	1	4
170-179	-	-	-	-	2	-	2
200	-	-	-	-	1	-	1
220-229	-	-	-	1	5	1	7
250	-	-	-	-	1	-	1
300	-	-	-	-	1	-	1
320	-	-	-	-	1	-	1
330-339	-	-	-	1	2	-	3
380	1	-	-	-	-	-	1
450	-	1	-	-	-	-	1
525	-	1	-	-	-	-	1
Total	2	2	1	2	18	9	34

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/There was 1 undocumented vessel in September 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 26 in 1964; 2 in 1957; 1 in 1956; 3 prior to 1944; and 2 unknown.

3/Includes vessels reported lost, abandoned, forfeited, sold, alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U.S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-October 31, 1964, amounted to 37,162,653 pounds (about 1,769,650 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (14.5 percent) than the 43,462,313 pounds (about 2,069,634 standard cases) imported during January 1-November 2, 1963.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, SEPTEMBER 1964:

United States imports of processed edible fishery products in September 1964 were down 6 percent in quantity from those in the previous month, although the value of the imports was about the same in both months. The decline in quantity was due mainly to a drop in imports of frozen groundfish blocks and slabs from Canada, Iceland, and Greenland.

Compared with the same month in 1963, imports in September 1964 were up 7 percent in quantity and 13 percent in value. In September 1964 there were larger imports of canned sardines, canned crab meat, sea catfish fillets, flounder fillets, and halibut fillets. But imports were down for canned oysters, canned albacore tuna, and haddock fillets.

In January-September 1964, imports were up 1 percent in quantity and 5 percent in value from those in January-September 1963. During January-September 1964, there were larger imports of groundfish blocks (increase mainly from Canada and Iceland), flounder fillets, yellow pike fil-

U.S. Imports and Exports of Processed Edible Fishery Products, September 1964 with Comparisons

Item	Quantity				Value			
	Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
	1964	1963	1964	1963	1964	1963	1964	1963
	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
Fish & Shellfish:								
Imports 1/	48.7	45.7	392.7	388.6	15.2	13.4	118.4	113.0
Exports 2/	5.6	2.9	33.7	22.9	3.9	2.1	17.2	10.6

1/Includes only those fishery products classified by the U.S. Bureau of Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

lets, sea catfish fillets, halibut fillets, and canned sardines not in oil. But there was a decline in imports of canned tuna, canned crab meat, canned oysters, canned salmon, swordfish fillets, and haddock fillets.

Exports of processed edible fish and shellfish from the United States in September 1964 were up 24.4 percent in quantity and 34.5 percent in value from those in the previous month. Heavy September shipments of canned salmon--totalling almost 3.0 million pounds and going mainly to the United Kingdom--accounted for most of the increase. There was some decline in exports of canned shrimp and canned squid.

Compared with the same month of 1963, the exports in September 1964 were up 93.1 percent in quantity and 85.7 percent in value. Again, the increase was due mainly to larger shipments of canned salmon. Exports were also up for canned squid (principally to Greece and the Philippines), canned sardines not in oil, and canned shrimp. But exports were down for canned mackerel.

Processed fish and shellfish exports in the first 9 months of 1964 were up 47.2 percent in quantity and 62.3 percent in value from those in the same period of 1963. In January-September 1964 there were much larger shipments of canned mackerel and canned salmon. Exports of canned shrimp and canned sardines in oil were also higher, but exports of canned sardines not in oil and canned squid were down.

Notes: (1) Prior to October 1963, the data shown above were included in news articles on "U.S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U.S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U.S. imports of crude or non-processed fishery products is not available; therefore, only import data are, therefore, not comparable to previous reports of "U.S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U.S. Exports of Edible Fishery Products." The export data in this series have always been limited to manufactured or processed products.

(2) See *Commercial Fisheries Review*, December 1964 p. 66.

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NEW UNITED STATES EXPORT CLASSIFICATION SCHEDULE:

A new classification for United States export commodities was placed in effect January 1, 1965, by the U. S. Bureau of the Census. The new classification is designated as Schedule B, 1965 Edition. The old Schedule B, in effect since 1958, became obsolete on December 31, 1964.

Schedule B, 1965 Edition, contains some 3,600 classifications for export commodities, compared with 2,600 classifications under the old Schedule B. It shows 7-digit rather than 5-digit code numbers. The new export classification must be used for all shipments made after December 31, 1964, and the new 7-digit numbers must be reported for all such shipments.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-JULY 1964:

Airborne fishery imports into the United States in July 1964 were up 40.2 percent in quantity and 29.7 percent in value from those in the previous month. The increase was due to heavier imports of shrimp from Venezuela.

Total airborne shrimp imports in July 1964 consisted of 1,049,117 pounds of fresh and frozen raw headless and 12,140

pounds of unclassified shrimp. About 99 percent of the airborne shrimp arrivals in July 1964 entered through the Customs District of Florida. The remainder entered through the Customs Districts of New Orleans (La.), Galveston (Tex.), New York (N. Y.), and Puerto Rico. Live northern lobsters from Canada were the main shellfish item other than shrimp imported by air in July 1964.

Fish fillets from Mexico accounted for the bulk of the airborne finfish imports in July 1964.

Total airborne fishery imports in January-July 1964 were down 20.2 percent in quantity and 23.0 percent in value from those in the same period of 1963. The decline was due to smaller shipments of shrimp and spiny lobsters from Central and South American countries.

U. S. 1/Airborne Imports of Fishery Products, January-July 1964 with Comparative Data

Product and Origin 2/	1964 July		1964 Jan.-July		1963 Jan.-July	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:						
Mexico	40.6	5.1	269.1	58.3	177.8	53.9
British Honduras	-	-	1.8	0.4	33.9	8.6
Honduras	-	-	-	-	16.5	4.3
Japan	-	-	-	-	2.0	8.2
United Kingdom	-	-	1.9	3.6	1.6	4.2
Iran	-	-	-	-	1.2	7.4
France	-	-	4.3	7.8	0.7	0.6
Rumania	-	-	0.9	9.0	-	-
Venezuela	-	-	4.6	1.7	-	-
U. S. S. R.	-	-	-	-	26.8	70.2
Denmark	0.4	1.1	1.0	2.3	-	-
Canada	-	-	14.8	4.8	-	-
Spain	0.7	0.6	3.9	3.3	-	-
Other countries	-	-	3.8	2.7	0.8	0.3
Total fish	41.7	6.8	306.1	93.9	261.3	157.7
Shrimp:						
Guatemala	-	-	-	-	141.6	74.0
El Salvador	-	-	159.1	96.8	209.1	143.4
Honduras	10.3	3.8	10.3	3.8	22.7	11.9
Nicaragua	6.3	3.6	78.2	44.8	380.2	122.5
Costa Rica	14.8	6.5	203.1	114.6	375.0	179.2
Panama	56.9	41.4	569.0	350.8	1,054.6	561.8
Venezuela	961.9	447.2	3,124.0	1,431.3	3,028.4	1,455.0
Ecuador	-	-	-	-	111.6	39.4
France	-	-	-	-	2.6	0.9
British Guiana	-	-	10.5	5.2	-	-
Mexico	-	-	-	-	13.2	6.9
Other countries	11.1	4.0	12.0	5.1	-	-
Total shrimp	1,061.3	506.5	4,166.2	2,052.4	5,339.0	2,595.0
Shellfish other than shrimp:						
Mexico	-	-	9.0	4.8	79.6	45.3
British Honduras	8.2	2.2	91.0	52.6	113.5	83.5
El Salvador	-	-	-	-	5.0	3.6
Honduras	6.5	1.3	19.4	10.7	1.9	1.0
Nicaragua	-	-	50.5	40.0	101.0	62.3
Costa Rica	-	-	9.3	9.5	73.8	60.1
Jamaica	-	-	43.6	36.2	51.0	40.1
Netherlands Antilles	-	-	-	-	32.8	20.9
Colombia	-	-	-	-	8.0	21.7
Ecuador	-	-	-	-	2.2	1.8
Tunisia	-	-	-	-	0.8	0.9
British Guiana	-	-	14.5	3.2	1.7	0.3
Canada	-	-	312.9	173.4	213.3	109.2
Venezuela	105.1	60.4	312.9	173.4	213.3	109.2
Dominican Republic	1.3	0.6	9.1	2.1	22.0	20.7
Bahamas	-	-	10.6	6.8	-	-
Haiti	1.4	0.7	7.0	3.8	-	-
Other countries	0.1	0.1	0.6	0.7	4.8	4.1
Total	122.6	65.3	577.5	343.8	725.1	481.5
Grand total	1,225.6	578.6	5,049.8	2,490.1	6,325.4	3,234.2

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including weight of containers, wrappings, crates, and moisture content.

4/F.o.b., point of shipment. Does not include U. S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: *United States Airborne General Imports of Merchandise*, FT 380, July 1964, U. S. Bureau of the Census.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

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TRENDS IN UNITED STATES EXPORTS OF FISHERY PRODUCTS BY COUNTRY, 1963:

In 1963, the value of United States exports of fishery products gained sharply as compared with 1962. The value of fishery products exported during 1963 was \$56.6 million, an increase of 58 percent. The 1963 value established a record for exports of fishery products. The major products contributing to the increase were fish oils, frozen shrimp, and frozen salmon.

Table 1 - Value of United States Exports of Fishery Products, 1954-1963

Year	Edible	Inedible	Total
	. . . . . (US\$1,000).		
1963	30,379	26,227	56,606
1962	22,470	13,258	35,728
1961	19,594	15,116	34,710
1960	25,622	18,543	44,165
1959	26,747	17,495	44,242
1958	19,440	11,564	31,004
1957	20,549	15,403	35,952
1956	22,939	16,564	39,503
1955	24,923	15,054	39,977
1954	16,238	15,289	31,527

Trend by Countries: During 1963, U. S. fishery products were exported to 108 countries. Of total exports, 75 percent was shipped to six countries: United Kingdom, Canada, Japan, Sweden, West Germany, and Netherlands (table 2). Shipments to all of those countries increased substantially.

Table 2 - United States Exports of Fishery Products by Selected Countries of Destination, 1959-1963

Country	1963	1962	1961	1960	1959
	. . . . . (US\$1,000).				
United Kingdom	13,081	8,249	4,554	8,460	8,928
Canada	11,156	8,846	10,265	10,309	8,644
Japan	7,819	939	2,984	3,295	928
Sweden	4,473	1,076	1,665	2,613	3,176
West Germany	3,638	1,467	1,555	2,201	2,888
Netherlands	2,593	2,273	2,385	4,350	4,352
Switzerland	2,229	1,712	738	1,082	762
France	1,889	1,073	1,007	1,048	766
Italy	1,643	869	423	643	303
Norway	1,539	403	2,390	1,390	1,296
Greece	566	487	364	313	306
Belgium	445	547	351	537	746
Philippines	403	320	582	2,494	5,587
Hong Kong	388	383	368	269	229
Mexico	263	375	459	616	663
Australia	203	198	458	444	157
Venezuela	183	274	360	461	614
Ecuador	1	171	82	293	193
Cuba	-	243	-	175	787
Other	4,094	5,823	3,720	3,172	2,917
Total	56,606	35,728	34,710	44,165	44,242

United Kingdom: In 1963, exports of fishery products to the United Kingdom increased by 58 percent. The United Kingdom displaced Canada as the leading export market for U. S. fishery products, with products valued at \$13.1 million or about 23 percent of the total U. S. exports of fishery prod-

ucts. Fish oils and canned salmon were the principal items shipped to the United Kingdom. Exports of fish oil increased \$3.6 million over 1962. The major fishery commodities exported to the United Kingdom were:

Commodity	1963	1962
	. . . . (US\$). . . .	
Fish and marine-animal oil	5,142,000	1,511,000
Salmon, canned	6,006,000	5,622,000
Salmon, fresh or frozen	777,000	138,000
Shrimp, canned	798,000	682,000
Other	358,000	296,000
Total	13,081,000	8,249,000

Canada: In 1963, Canada was in second place as an export market for U. S. fishery products. The value of these exports to Canada rose 26 percent above the previous year. The principal items exported to Canada were:

Commodity	1963	1962
	. . . . (US\$). . . .	
Shrimp, fresh or frozen	2,165,000	2,081,000
Shrimp, canned	1,592,000	1,462,000
Seal furs	1,935,000	1,024,000
Fish, fresh or frozen	1,043,000	766,000
Canned fish	1,002,000	696,000
Fish, shellfish and other marine animal products, inedible	879,000	703,000
Fish, marine animal and liver oil	543,000	559,000
Salmon, fresh or frozen	581,000	197,000
Other	1,416,000	1,358,000
Total	11,156,000	8,846,000

Other Countries: The values of the principal fishery products exported to other major markets were:

Country & Product	US\$
Japan:	
frozen shrimp	5,153,000
unmanufactured shell	2,075,000
Sweden, fish oil	4,121,000
W. Germany, fish oil	2,293,000
Netherlands, fish oil	1,644,000
Switzerland, seal fur	1,989,000
France:	
frsh. or froz. salmon	803
seal fur	348
Italy, seal fur	956

Trend by Areas: During 1963, Europe imported products valued at about \$32.9 million, representing 58 percent of total U.S. fishery exports (table 3). The countries of the European Free Trade Association (EFTA) imported products with a value of \$21.8 million, or 38 percent of U.S. exports of fishery products. The members of the European Economic Community (EEC or Common Market) obtained fishery products valued at \$10.2 million, or 18 percent of total fishery exports. North American countries took products valued at \$13.2 million, or 23 percent of total U.S. fishery product exports.

Table 3 - United States Exports of Fishery Products by Area of Destination, 1963

Area	Edible	Inedible	Total
	. . . . . (US\$1,000).		
Europe	12,669	20,181	32,850
North America	9,547	3,695	13,242
Asia	6,836	2,174	9,010
South America	265	97	362
Africa	436	33	469
Oceania	625	48	673
Total	30,378	26,228	56,606

Trend by Commodities: In 1963, significant gains were made in exports of most of the major fishery products (table 4). Fish oils were the leading commodity entering this trade, accounting for 28 percent of total exports. Exports of fish oil increased 159 percent over 1962 owing to a substantial strengthening in the export market which had remained dull during most of 1962. Salmon products valued at about \$11.3 million were next in importance followed closely by shrimp with a value of \$10.8 million.

Table 4 - Value of United States Exports of Fishery Products by Selected Commodities, 1959-1963

Commodity	1963	1962	1961	1960	1959
. (US\$1,000)					
Fish oils	15,636	6,047	8,908	10,688	11,902
Seal furs	5,877	3,851	3,097	3,309	2,580
Shells, unmanufactured	2,136	1,285	1,380	2,636	977
Miscellaneous fish (mostly fresh water, fresh or frozen)	1,858	1,135	809	947	622
Oysters, shucked	191	311	448	497	575
Salmon:					
Fresh	2,530	872	647	1,677	659
Cured	509	528	593	435	372
Canned	8,239	7,292	5,580	9,830	10,639
Mackerel, canned	681	671	581	211	135
Miscellaneous fish, canned	628	460	391	355	326
Sardines, canned, not in oil	666	1,285	1,336	3,443	5,843
Shrimp, fresh or frozen	7,748	3,293	3,694	2,303	1,682
Shrimp, canned	3,054	2,572	2,487	3,383	2,898
Squid, canned	742	729	353	691	906

Foreign trade plays a significant role in the economics of the U. S. fishing industry. The United States is a leading importer of fishery products, buying foreign products valued at almost \$500.0 million in 1963. Exports, valued at \$56.6 million, provide important markets for certain products of U. S. fisheries. Many of those products are well recognized in world trade.



Wholesale Prices.

EDIBLE FISH AND SHELLFISH, NOVEMBER 1964:

Most of the fresh and frozen unprocessed finfish items were lower-priced from October to November 1964 and the overall wholesale price index for November dropped 2.4 percent from the previous month. At 108.9 percent of the 1957-59 average, the index this November was 2.6 percent higher than in the same month of 1963.

November prices for all of the major products in the drawn, dressed, or whole finfish subgroup were considerably lower than in October. A 16.3-percent drop in that index was due mainly to relatively sharp price declines for halibut, haddock, and salmon. At New York City, western halibut prices were 31.5 percent lower because of the seasonal changeover from the fresh to frozen. End-of-the-season fresh halibut supplies at New York City were very light in October and prices were high. Frozen dressed king salmon at New York City in November was lower-priced (13.8 percent lower) than the fresh which was still available the previous month. Ex-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, November 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Nov. 1964	Oct. 1964	Nov. 1964	Oct. 1964	Sept. 1964	Nov. 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.9	111.6	109.7	106.1
Fresh & Frozen Fishery Products:					113.0	116.6	113.7	109.0
Drawn, Dressed, or Whole Finfish:					111.7	133.4	129.1	117.0
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.17	107.8	135.5	110.9	124.7
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.38	.56	112.4	164.1	162.7	97.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.96	115.6	134.1	136.2	124.0
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.50	.54	74.6	79.8	70.9	83.6
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.65	.48	106.4	77.8	90.1	75.3
Processed, Fresh (Fish & Shellfish):					111.1	106.5	107.4	107.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.44	.40	106.9	97.1	106.9	131.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.88	.83	102.5	96.7	95.5	85.0
Oysters, shucked, standards	Norfolk	gal.	7.25	7.13	122.2	120.1	122.2	130.7
Processed, Frozen (Fish & Shellfish):					110.8	104.7	100.0	98.6
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.35	.36	88.7	91.2	92.5	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.39	.38	112.9	109.9	108.5	111.4
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	103.4	103.4	103.4	119.2
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.95	.87	112.7	103.2	95.5	89.5
Canned Fishery Products:					102.2	103.1	103.1	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.25	21.75	92.6	94.8	94.8	101.3
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	96.6
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	97.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	113.3

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

vessel prices at Boston for large haddock were down sharply (20.4 percent) from the high of the previous month. In contrast, prices skyrocketed (up 36.7 percent) for Lake Huron fresh round yellow pike because of very light supplies. As compared with November 1963, the subgroup index this November was 4.5-percent lower mostly because of lower prices for haddock and salmon.

All products listed in the subgroup for processed fresh fish and shellfish were higher-priced in November 1964 and the index was up 4.3 percent from the previous month. Prices for frozen haddock fillets rose 10.1 percent (but those prices were 18.5 percent lower than in November 1963) and South Atlantic fresh shrimp at New York City were up 6.0 percent. A somewhat stronger market for shucked standard oysters pushed November prices for that product up although those prices were 6.5 percent lower than in November 1963. As compared with the same month a year earlier, the subgroup index this November was higher by 3.6 percent largely because of substantially higher fresh shrimp prices.

A 5.8-percent increase from the previous month in the November 1964 processed frozen fish and shellfish subgroup in-

dex was due to higher frozen shrimp prices (wholesale price up 8 cents a pound) at Chicago. As compared with November a year earlier, the subgroup index this November was higher by 12.4 percent because of sharply increased prices (up 25.9 percent) for frozen shrimp. Prices this November for several species of frozen fillets in the subgroup were below those in November 1963 and tended to cancel out part of the November 1964 strong subgroup index rise caused by high shrimp prices.

Lower prices from October to November for Alaska canned pink salmon accounted for an 0.9-percent drop in the canned fishery products subgroup index. Prices for other canned fish items remained the same as in the previous month. Stocks of canned pink salmon were liberal in November and prevailing prices were lower than a year earlier by 8.6 percent. November 1964 prices for canned Maine sardines were unchanged since September. With the sardine packing season drawing to a close, the 1964 pack was slated to run far short of the previous season. The November 1964 subgroup index was 1.0 percent higher than in the same month a year earlier. Prices this November were higher for all canned fishery products except pink salmon.



SONAR TAGS USED TO STUDY FISH MIGRATIONS

Strange noises heard coming from a number of fish swimming in Lake Mendota, near Madison, Wis., were not so strange to aquatic biologists, who had equipped the fish with an ultrasonic signaling device to study their migratory habits.

Tags smaller than the tip of a pencil were inserted into the stomachs of white bass. These tags chirp ultrasonic signals (70 to 150 kilocycles), which are picked up by an underwater receiver in a boat following the fish. Researchers began experimenting with the tiny transmitter about a year ago. They have been charting the courses of the bass to discover how those fish so unerringly find their way back to home spawning grounds.

The white bass, which spawn in late May and early June, were chosen for the study because they always spawn in the same two areas of the lake near the shore. The tracking boat must stay within one-half mile of the marked fish and can receive signals for about 15 hours before the power supply is exhausted, the researchers reported. By tracking and charting the paths of the sonar-equipped fish in the lake, the researchers are trying to find environmental guides that the fish may use in their journey.

The researchers, who reported their fish-tracking work at a meeting of the National Academy of Sciences in Madison, are in the process of developing a more advanced tag to study the larger salmon. Eventually, the ultrasonic tag may be used to follow the migration patterns of other aquatic animals, such as porpoise and turtles.

The study is being supported by a National Science Foundation research grant. (Science News Letter, October 24, 1964.)



International

EUROPEAN ECONOMIC COMMUNITY

EEC COMMISSION WANTS TO MOVE UP TIMETABLE FOR CUSTOMS UNION:

The Commission of the European Economic Community (EEC) presented on October 2, 1964, in Brussels to the six member states a proposal to hasten the removal of intra-Community trade barriers and the completion of the common external tariff.

Dubbed "Initiative 1964," the proposal would bring the common external tariff for the EEC into effect on January 1, 1966, a year earlier than planned. At the same time, the size of internal EEC tariff cuts would be increased and all internal tariffs on industrial goods abolished by January 1, 1967. The initiative was offered to stimulate EEC decision-making.

The EEC Commission's initiative contained the following proposals:

- (1) establish the common external tariff on January 1, 1966;
- (2) speed internal tariff cuts to complete the customs union by January 1, 1967;
- (3) abolish indirect obstacles to trade within the EEC, particularly all controls at internal frontiers;
- (4) adopt a proposal for the progressive introduction of a monetary union;
- (5) intensify work in the social field.

The Commission will also submit, possibly before January 1, 1966, proposals concerning definition of origin and customs values, anti-dumping and compensatory duties, common arrangements for processing traffic, the unification of national provisions on free entry on economic grounds, and bonded warehouse

and free ports. The Commission will also propose a procedure for operating EEC tariff quotas and rules for the uniform application of the common external tariff.

The aim of the proposals, the Commission said, is the free movement of goods between EEC member states, beginning 1967. (*European Community Bulletin*, October 1964.)

FISH MEAL

WORLD PRODUCTION, SEPTEMBER 1964:

World fish meal production in September 1964 was lower than that in any previous month in 1964 due mainly to seasonal declines in the major producing countries.

World fish meal production in the first 9 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 49 percent of world output during January-September 1964. Higher production during January-September 1964 was also reported in Norway, South Africa, Chile, Iceland, and Angola. The increase was partly offset by lower production in Canada and the United States.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

Country	Sept.		Jan.-Sept.	
	1964	1963	1964	1963
	(Metric Tons)			
Canada	2,985	5,495	39,896	52,030
Denmark	12,620	10,478	82,571	80,443
France	1,100	1,100	9,900	9,900
German Fed. Republic	6,521	7,591	57,176	58,207
Netherlands	1/	1,200	2/ 3,500	4,700
Spain	I/	2,178	1/	16,912
Sweden	889	672	5,300	4,535
United Kingdom	5,185	6,077	58,223	58,241
United States	19,658	22,229	167,450	3/178,807
Angola	6,376	1,280	42,073	17,774
Iceland	15,693	13,277	102,245	77,337
Norway	12,257	14,086	146,815	102,085
Peru	49,478	47,828	1,059,070	826,673
So. Afr. (incl. S.-W. Afr.)	18,300	21,669	236,792	218,323
Belgium	375	375	3,375	3,375
Chile	10,777	2,438	114,236	75,019
Morocco	4,000	1/	17,150	1/
Total	166,214	157,973	2,145,572	1,784,361

1/Data not available.

2/Data available only for Jan.-June 1964.

3/Revised.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

International (Contd.):

FOOD AND AGRICULTURE ORGANIZATION

FISHERY PROBLEMS DISCUSSED AT
11TH SESSION OF INDO-PACIFIC
FISHERIES COUNCIL:

Numerous facets of fisheries research and the fishing industry in general, were considered and discussed at the 11th Session of the Indo-Pacific Fisheries Council (IPFC) of the Food and Agriculture Organization (FAO), held at Kuala Lumpur, Malaysia, October 16-31, 1964. Attention was focused mainly on problems confronting Asian countries, with emphasis on the conflicts arising between large-scale trawlers and inshore fishermen.

On certain problems relating to the fishing industry in Malaysia, the Council recommended that: (1) Malaysia should carry through with its present experiment for trawling in the waters around Pulau Langkawi; (2) a loan fund should be established to assist inshore fishermen in developing new fishing techniques, such as trawling, to improve catches; (3) research should be carried out to assess groundfish resources in relation to the amount of fish caught; and (4) appropriate measures should be adopted to prevent overfishing.

During the session, FAO spokesman announced the FAO was planning to establish a separate fisheries department in its organization. The Regional Information Advisor of that Organization stated that FAO is planning to make documentary films, tape recordings, and reports on fishing activities in that part of the world.

At the session, a Canadian Colombo Plan expert attached to the Planning and Research Branch of the Ministry of Agriculture and Cooperatives, suggested that the Government should take over the marketing of fish initially to release the middleman's grip on fishermen in developing countries

Member countries participating in the Conference included Australia, Ceylon, France, India, Japan, Korea, Malaysia, Netherlands, Pakistan, Philippines, Thailand, United Kingdom (for Hong Kong), the United States, and Viet-Nam. Two nonmember countries, New Zealand and Norway, and six international organizations sent observers. The international organizations included the General Fisheries Council for Mediterranean

(GFCM), the International Oceanographic Commission (IOC), Pacific Science Association (PSA), Pan Indian Ocean Science Association (PIOSA), the United Nations Technical Assistance Organization Board (UNTAB), the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the Food and Agriculture Organization (FAO). Burma, Cambodia, and Indonesia did not participate. (United States Embassy, Kuala Lumpur, November 5, 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 73

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SARDINE-TAGGING SEMINAR:

How best to tag the tiny sardine, and then what to do with the tag once it has been recovered, was discussed by 18 Mediterranean sardine scientists at a meeting held in Split, Yugoslavia, November 2-14, 1964. The seminar on sardine tagging in the Mediterranean was sponsored by the Food and Agriculture Organization (FAO).

The sardine is of very significant commercial importance to the fishing nations of the Mediterranean. Tagging is a basic tool for determining the growth, distribution, migration, habits, mortality rate, stock, and population size of the fish. Yet the sardine is one of the most difficult fish in the world to tag.

At the seminar, the scientists hoped to work out a model program--including methods of tagging and tag recovery, suggestions for improving cooperation between the various countries--to be presented before a session of the General Fisheries Council for the Mediterranean to be held in Rome in March 1965. (Food and Agriculture Organization, Rome, October 28, 1964.)

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

11TH ANNUAL MEETING:

The 11th Annual Meeting of the International North Pacific Fisheries Commission (made up of representatives from Canada, Japan, United States) was held in Tokyo, Japan. The plenary sessions started November 16, 1964. The meeting extended over nearly 4 weeks, with 3 weeks of scientific sessions preceding the week of plenary sessions.

The Commission reviewed the results of conservation programs and scientific research on North Pacific fishery resources and discussed their implications for the fishing indus-

International (Contd.):

tries of the three countries. Nearly 100 administrators, scientists, technical and industrial advisors and observers took part in the discussions, which centered around the general problem of ensuring the continued orderly development of the North Pacific fisheries resources under effective conservation safeguards.

At this meeting the Commission did not recommend any change in the list of stocks of fish under the "abstention" provisions of the North Pacific fisheries convention.

One of the Commission's major concerns at this meeting was with the condition of the halibut resource of the Eastern Bering Sea, where in 1964, for the second year, the Commission was responsible for regulating a fishery shared by fishermen of the three countries. In the 1964 fishing season, halibut fishermen of the three countries were able to catch only about one-third of the catch quota of 6,393,340 pounds set by the Commission. In view of this and other evidence that the Bering Sea halibut resource is at a low ebb, the Commission recommended to its Member Governments that fishing in the quota area be limited to only 7 days, and the open season in other parts of the Eastern Bering Sea will also be shortened. Other regulatory measures were approved for recommendation to the Governments by the Commission.

The Commission has also been concerned in recent years with the problems created by the developing fisheries for the shrimp and bottomfish, such as flounder, ocean perch, and sablefish (black cod), in the Gulf of Alaska. At this year's meeting the Commission noted that development of the trawl fisheries by Japan has been proceeding gradually and with due regard to their effects on the halibut fishery. The results of research on this problem, as reported to the Commission at the annual meeting, held out hope that proper selection of fishing gear and operating techniques will minimize damage to the halibut stocks as the rich resources of other bottomfish come under increased exploitation. Research on those problems and exchange of scientists and data will be continued. In this connection, the Japanese representatives offered to facilitate studies of bottomfish by Canadian and United States scientists aboard Japanese trawlers in the Gulf of Alaska.

The Commission, which during recent years has examined the condition of the king crab fishery of the Eastern Bering Sea to determine whether conservation measures are needed, noted that the Governments of Japan and the United States have recently negotiated an agreement regarding that fishery. In response to requests from the two Governments, the Commission resolved to continue and to strengthen its program of king crab research.

At the 11th Annual Meeting the Commissioners heard reports of further progress in the publication of results of the research carried on by Commission scientists over the past 10 years. One of the major elements in this publication program is a nine-part comprehensive report on the biology of North Pacific salmon written jointly by scientists from the three countries. The writing of this major contribution is largely finished, and several sections are scheduled for publication in 1965.

The 12th Annual Meeting of the International North Pacific Fisheries Commission will be held at Seattle, Wash., with the first plenary session scheduled for November 8, 1965. The new Chairman of the Commission will be Edward W. Allen of the United States, the new Vice-Chairman will be A. W. H. Needler of Canada, and the new Secretary will be Iwao Fujita of Japan.

INTERNATIONAL NORTH PACIFIC
FISHERIES CONVENTIONCANADIAN FISHERIES MINISTER REPORTS
ON OTTAWA RENEGOTIATION TALKS:

The third round in a series of talks between Canada, Japan, and the United States on the International Convention for the High Seas Fisheries of the North Pacific Ocean, which opened in Ottawa, September 9, 1964, ended on October 1.

While considerable progress was made at the meeting with respect to exchange of views and the study of proposals in efforts to resolve remaining differences between the three Parties to the Convention, it was decided by the delegations that complete agreement on modification of the treaty under which the Pacific Fisheries Commission was established in 1953 could not at that time be reached. The meeting was adjourned with recommendations to the Governments that a fourth meeting be convened at a later date for the purpose of reaching final agreement.

International (Contd.):

At the October 1, 1964, meeting of the Canadian Parliament, Canada's Minister of Fisheries gave a report on the negotiations held in Ottawa for the revision of the North Pacific Fisheries Convention. In his statement the Minister said that the Canadian delegation put forward its best efforts to bring about an agreement, and that valuable progress had been made toward the solution of the remaining differences which he hoped would be reconciled at a later meeting. The statement of the Canadian Minister of Fisheries to the House of Commons follows:

"Mr. Speaker, hon. members will recall that when the estimates of the Department of Fisheries were before the house last week I promised that at the conclusion of negotiations which were taking place here in Ottawa among Canada, Japan and the United States for the revision of the north Pacific fisheries convention I might be able to make a statement to the house.

"At the opening session of the Ottawa negotiations I expressed the hope on behalf of the Canadian delegation that this third meeting of the parties to the international north Pacific fisheries convention would resolve the remaining differences and would culminate in a successful conclusion of the protracted negotiations. Three weeks of uninterrupted negotiations have brought the parties very close to agreement, but it has not been possible to reconcile all the remaining differences, and the delegations have agreed to a recess in the discussions in order to study and recommend to their respective governments other approaches to the unsolved problems.

"We had hoped that final agreement could have been reached for the revision of the existing convention which, of course, continues in force but which may be terminated upon twelve months' notice by one of the parties. At the same time we realize that the problems with which the delegations have been faced are very complex, and that all must be solved before agreeing on a convention which we hope will remain in force for many years. The frank and co-operative attitudes of the delegations have permitted much progress and encourage us to hope that we shall reach agreement at our next meeting.

"I should like to give, for the information of the house, a very brief résumé of the Canadian position. The salmon runs to our streams are of the very highest importance to the fisheries of Canada's Pacific coast. We believe that through scientific study, strict regulation and positive fish culture methods we have maintained these stocks which would otherwise have disappeared. We believe that the salmon resource can be greatly increased by the application of scientifically based techniques which are now emerging. But this maintenance and increase of the runs require not only that

we continue our intensive efforts in research, regulation and culture, but that we also continue, at considerable cost to our economy, the protection of our rivers from other uses which would make them unsuitable for salmon. To justify all these costs of maintaining and, we confidently expect, increasing the salmon resources the benefits must accrue to the Canadian economy.

"During the past three weeks much progress has been made toward agreement which would meet our needs in an acceptable manner. It seems that, on the one hand, the basis for the Canadian position is now well understood and is given sympathetic consideration. On the other hand we realize that recognition of our special interests must be contingent on continuation of our special efforts to maintain and increase the salmon stocks and on continued full utilization by our fishery, and that the situation must therefore be subject to review by the commission established by the convention. We have been very close to agreement which would embody these essential points.

"The greatest unsolved problem is concerned with conservation measures for those stocks of North American salmon which now are fished on the high seas. Although the problem applies especially to sockeye of Alaska origin, Canada has a potential interest in a solution which could be applied to other stocks fished on the high seas although to a much more minor degree. We are also concerned by the growing scientific evidence that the high seas fishing of salmon stocks which are intensively fished inshore may be wasteful.

"It appears that we are close to agreement on a formula which would be acceptable in so far as the major halibut producing areas are concerned. This formula would recognize the long history of research and regulation by the international Pacific halibut commission on behalf of the governments of Canada and the United States, and the resulting successful restoration and maintenance of the important halibut fishery. We had hoped that similar protection could be extended to other areas where the stocks have been the subject of similar study and regulation and are utilized by our fishermen. This must now be a matter for further discussion.

"Regarding herring, we hope that a satisfactory solution can be reached as herring is not of significant importance to Japan.

"To conclude, I am satisfied that the Canadian delegation, to whom I am very grateful, has put forward its best efforts to bring about agreement which would provide the greatest measure of protection to those Pacific coast fisheries which are the mainstay of our fishing industry in British Columbia. I am also encouraged by the valuable progress that has been made toward the solution of the remaining differences, and hope that these may finally be reconciled at the next meeting."

Note: See Commercial Fisheries Review, December 1964 p. 79; November 1964 p. 67; September 1964 p. 55.

International (Contd.):

INTERNATIONAL COUNCIL FOR THE
EXPLORATION OF THE SEASYMPOSIUM PLANNED ON ECOLOGY
OF PELAGIC FISH SPECIES
IN ARCTIC WATERS:

A Symposium on the Ecology of Pelagic Fish Species in Arctic Waters, planned by the International Council for the Exploration of the Sea (ICES), is scheduled to be held just prior to the Statutory Meeting of ICES in Copenhagen, Denmark, in the fall of 1966. The Symposium is to be held in accordance with recommendations made at the last two ICES meetings.

The Symposium is intended to mainly cover a number of species which, due to their only minor direct importance to the fishery and also to their living partly outside the range of the commercial fisheries, have been somewhat neglected in the research work. However, most of those species play, due to their great quantities, a considerable role as links in food chains and a few of them have become important to industrial fisheries.

The Symposium is planned to be limited to pelagic or semipelagic fish which inhabit or reach into the Arctic or sub-Arctic regions of the North Atlantic. Examples of such species are: Mallotus, Argentina, Osmerus (and possibly other salmonids); smaller gadoids as G. saida, G. esmarkii, G. ogac, G. navaga, G. poutassou; Ammodytes. Species of the herring, tuna, mackerel, and ocean perch (redfish) groups do not fall within the scope of the Symposium.

Although the Symposium is formally limited to the Arctic region, the ecology of those species in areas bordering the Arctic can also be included when necessary to ensure an adequate treatment of the subjects.

The Symposium is to be limited to include three subjects:

- (1) The species as links in food chains;
- (2) The species as basis for the fisheries; and
- (3) The distribution and migration of the species, and their effects upon the availability of commercial fishes.

Participation in the Symposium is not only open to the ICES member countries, but also

to others and invitations to participate are to be extended to Canada and the United States.

The deadline for acceptance of contributions by the ICES Secretariat is fixed for May 1, 1966, in order to make possible an advance distribution of papers to participants. To facilitate the prearrangement of the symposium, it is requested that the ICES Secretariat, where possible, be given notice of contributions (authors' names and titles) at an earlier date than May 1, 1966. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 11, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 68

CONVENTION ON FISHING AND CONSERVATION OF
LIVING RESOURCES OF THE HIGH SEAS

RATIFIED BY UGANDA:

Uganda deposited its ratification, on September 14, 1964, to the International Convention on Fishing and Conservation of Living Resources of the High Seas. This brings to 17 the number of nations which have deposited accession to the Convention. A total of 22 ratifications is needed before the Convention enters into force.

On the same date, Uganda also acceded to the Convention on the High Seas, the Convention on the Continental Shelf, and the Convention on the Territorial Sea and Contiguous Zone. Those Conventions entered into force on September 30, 1962, June 10, 1964, and September 10, 1964, respectively.

Note: See Commercial Fisheries Review, November 1964 p. 70; October 1964 p. 49.

ORGANIZATION FOR ECONOMIC
COOPERATION AND DEVELOPMENTSANITARY REGULATIONS FOR CANNED
FISH DRAFTED AT MEETING OF EXPERTS:

A meeting of experts on sanitary regulations and quality standards for canned fishery products was held by the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) at Paris, France, November 30-December 3, 1964.

The agenda included the following: (1) Drafting quality standards for (a) canned brisling, brisling sardines, and sprats; (b) canned smoked or unsmoked sild packed from young herring (Clupea harengus) as "sild-sardines" in oil, tomato sauce, or other packing media; (c) canned herring in tomato sauce, brine, or edible oil; (d) canned sardine in tomato sauce or oil; (e) other canned herring. (2) Drafting a Code of Practice.

International (Contd.):

The drafts were discussed and finalized by the experts attending the meeting. The final drafts are to be submitted to Member Countries and to the OECD Committee for Fisheries.

The North American consultant on this project, selected by both the United States and Canada, was Reginald Bolton of the Canadian Fisheries Inspection Service. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 10, 1964.)

UNITED NATIONS SPECIAL FUND

FISHERIES DEVELOPMENT PROJECTS:

Six United Nations Special Fund projects to aid fisheries are now in operation. Those projects are located in Peru (Marine Resources Research Institute), Ecuador (National Fisheries Institute), India (Central Institute of Fisheries Education), Nigeria (Fisheries Survey in the Western Region), Rhodesia (Lake Kariba Fisheries Institute), and Chile (Fisheries Development Institute).

Other fishery projects for individual countries were approved by the Special Fund in 1964 with the Food and Agriculture Organization (FAO) as the executing agency. Those are in Korea (Deep Sea Fishing Training Center), the Philippines (Deep Sea Fishing Development Project), and Aden (Gulf of Aden Fisheries Survey and Training Project). Preliminary plans for those projects have been prepared.

A regional project for fisheries development in the Caribbean area has also been approved by the Special Fund with FAO as the executing agency. A plan of operation for the project has been prepared and discussed with the participating countries.

Other fishery projects being considered by the Special Fund concern Ceylon, Pakistan, Argentina, Ghana, Central Africa (regional), and East Africa (regional). The proposed projects are mainly concerned with marine fisheries, although the East African regional project involves inland fisheries. (Information Bulletin of General Fisheries Council for the Mediterranean, July 1964.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 30; Nov. 1963 p. 58; Jan. 1963 p. 108; Sept. 1960 p. 50.

WHALING

JAPANESE VIEWS ON ANTARCTIC WHALING DEVELOPMENTS:

The following are Japanese press comments on Antarctic whaling developments and their possible effect on the 1964/65 season.

Norway and the Soviet Union held a meeting in Oslo, Norway, on or about October 19, 1964, to discuss the catch quota for the 19th Antarctic Whaling Expedition, reported the Japanese Government on October 31. Japan was not represented at that meeting. At the meeting of the two nations, Norway apparently agreed to an increase in the Soviet Union's whale catch quota, from 1,600 blue-whale units (representing 20 percent of the international whale catch quota) to a total of 2,000 units. This action not only increases the overall catch quota agreed to among the whaling countries for the 19th Expedition (1964/65 season), from 8,000 units to 8,400 units, but also upsets the international share agreement concluded among member countries.

The Soviet Union was expected to declare an increased catch quota of 2,000 units for the 1964/65 season, but Japan plans to harvest only 4,160 units, the amount allocated to her by agreement with other whaling nations. In a statement made to the press on October 22 concerning his objection to attending the meeting proposed by Norway, the President of the Japan Whaling Association declared that the Japanese industry is not excessively concerned about Soviet intentions. He stated that "even assuming that Norway had requested a meeting since she was afraid that the Soviet Union might increase her catch, the Japanese industry is not that concerned over such a development since it is the opinion of the whale scientists that the whale catch for the coming season will not exceed 8,500 units, even if additional effort should be employed." He added that Japan would operate within her agreed quota.

On October 23, Japanese Government sources revealed that on September 30, Japan had filed an objection with the International Whaling Commission's adoption (at the June 1964 Annual Meeting) of an amendment to the Whaling Convention which would entirely prohibit the catching of blue whale stocks in the Antarctic Ocean. The Convention has prohibited the harvesting of blue whales due to the serious decline of that stock observed in recent years, but permitted limited whaling

International (Contd.):

for pygmy blue whales within the area bounded by 0°-80° E. longitude and 40°-55° S. latitude. The amendment now nullifies that provision and completely restricts all blue whaling operations.

Japan contends that pygmy blue whales have shown no decline at all and sees no reason why the harvesting of that species should be prohibited. Citing the findings of the Commission's Scientific Committee that the pygmy blues could be taken for the next three years at the rate of about 400 units a year without jeopardizing that stock, Japan suggested the possibility of selective catching of that species within the area 30°-80° E. longitude and 40°-55° S. latitude. However, that proposal was rejected by the Commission. (Nihon Suisan Shimbun, November 2; Suisan Keizai Shimbun, October 23 & 24, 1964.)

According to the Japanese periodical Nihon Suisan Shimbun, the Government of Norway, which in response to the desire of the Soviet Union had proposed a meeting of the Antarctic pelagic whaling countries to seek adjustments in the catch quota established for the 19th Antarctic Whaling Expedition, has abandoned her efforts to convene that meeting. The meeting reportedly was cancelled due to Japan's refusal to take part in it, but the periodical claims that the aim of that meeting was to abolish the existing quota and to legally grant the Soviet Union a quota of 2,000 blue-whale units (increase of 400 units), so it was only natural for Japan to refuse to participate in that meeting.

The periodical goes on to state: "The fact that the proposed meeting failed to materialize means the end of the 8,000-unit catch quota informally adopted by the whaling nations for the coming whaling season. Thus, from the standpoint of the International Whaling Commission, the interpretation can be made that the existing international catch share of 52 percent for Japan, 28 percent for Norway, and 20 percent for the Soviet Union is no longer valid. For that reason, while Japan's persistent refusal to attend that meeting was unavoidable, it is conceivable that Japan's attitude may have placed her in a very unfavorable position internationally..."

"The 8,000-unit catch quota agreed to by the whaling countries, despite strong opposition from the Commission's nonwhaling coun-

tries, will again be slightly increased, and it can already be anticipated that the Commission, at next year's annual meeting, will criticize the attitude of the whaling countries, particularly Japan, as a result of the Soviet strategy. There is also a strong possibility that the Commission will seek to revise the international quota, since the three whaling countries have declared for the 19th Expedition catch targets not based on the international quota. Now that the whaling fleets have departed for the fishing grounds, the Japanese Government and industry must unite and develop countermeasures to cope with these problems." (Nihon Suisan Shimbun, October 30, 1964.)

Note: See Commercial Fisheries Review, September 1964 p. 54.



Australia

EXPORTS AND PRODUCTION OF SPINY LOBSTERS, AND TRENDS, FISCAL YEAR 1963/64:

Australia's exports of spiny lobster (tails, whole, cooked) in fiscal year 1963/64 (ended June 30, 1964) amounted to 10.7 million pounds with an estimated value of US\$13.5 million. The United States as the principal importer of Australian lobster tails took about 80 percent of those exports; France was in second place with about 16 percent.

While exports to the United States were down slightly from the previous year, those to France doubled--from about 865,000 pounds in 1962/63 to 1.7 million pounds in 1963/64. Exports to France were made up of 700,000

Table 1 - Australia's Exports of Spiny Lobsters--Tails and Cooked Whole, 1962/63-1963/64

Country	1/1963/64		1962/63	
	Tails	Whole	Tails	Whole
	(1,000 Lbs.)			
United States	8,290	216	8,745	501
France	750	951	123	742
Canada	272	-	57	-
South Africa	41	1	2	-
Singapore	28	67	11	77
Netherlands	4	-	8	-
Belgium-Luxembourg	2	17	-	6
Japan	2	11	-	-
German Federal Republic	-	13	-	10
Greece	4	4	-	1
Italy	-	29	3	15
Arabian States	7	-	7	1
New Caledonia	5	4	5	4
Other	11	13	41	23
Total	9,416	1,326	9,002	1,380
1/Subject to revision.				

Australia (Contd.):

pounds of tails and 1 million pounds of whole lobster, with a total value of \$1.6 million.

The average price per pound for spiny lobster exported to all countries during the period was about \$1.30 for tails and about 73 cents for whole lobster. Exports to the

A new trend in spiny lobster grade patterns is indicated in Western Australia. Midget lobster which accounted for 18 percent of the tails exported in 1962/63 now account for 24 percent. On the other hand, medium tails which are popular in the United States fell from 28 to 25 percent, while large and jumbo sizes combined dropped from 21 to 18 percent. Jumbo tails which formerly brought

Table 2 - Australia's Exports of Spiny Lobsters by States, 1960/61-1963/64

	New South Wales	Victoria	Queensland	South Australia	Western Australia	Tasmania	Total
	(1,000 Lbs.)						
1963/64: Tails . . .	63	481	32	743	7,834	263	9,416
Whole ^{1/} . . .	17	271	17	180	813	28	1,326
1962/63: Tails . . .	7	529	-	573	7,690	203	9,002
Whole . . .	15	348	-	44	797	176	1,380
1961/62: Tails . . .	115	855	42	524	7,947	392	9,875
Whole . . .	8	64	9	-	419	13	513
1960/61: Tails . . .	100	563	-	186	5,047	127	6,023
Whole . . .	208	353	-	6	1,017	199	1,783

^{1/}Estimated.

Table 3 - Australia's Spiny Lobster Production, 1957/58-1963/64

	New South Wales	Victoria ^{1/}	Queensland	South Australia	Western Australia	Tasmania ^{1/}	Total
	(1,000 Lbs.)						
1963/64 ^{2/} . . .	400	940	10	4,050	21,500	3,750	30,650
1962/63 . . .	491	1,080	31	4,650	^{3/} 21,380	3,761	31,393
1961/62 . . .	384	1,138	58	4,025	^{3/} 19,772	3,964	29,341
1960/61 . . .	467	1,266	41	3,721	18,019	3,971	27,485
1959/60 . . .	492	830	40	3,500	19,545	3,601	28,008
1958/59 . . .	461	823	25	4,250	17,517	3,226	26,302
1957/58 . . .	525	636	23	4,460	13,327	2,993	21,964

^{1/}Catch by Victorian fishermen in Tasmanian waters has been included in Tasmania.

^{2/}Estimated.

^{3/}Partly estimated.

Source: 1957-58 to 1962-63, Commonwealth Statistician; 1963-64, State Fisheries.

United States during the period averaged about \$1.35 a pound for tails.

Five years ago the United States took about 90 percent by weight of the total Australian spiny lobster exports. But the trend in recent years has been toward greater market diversification. While the United States takes the main portion of the exports, Australia has increased its spiny lobster exports to France, Canada, and other countries. Although high prices and less dependence on the United States has strengthened the market for spiny lobster, indications are that Australian production may not keep pace with the demand.

Australian spiny lobster production in 1963/64 was estimated to be 30.7 million pounds (live weight), a decline of about 2 percent from the previous year. The most productive state was Western Australia, which accounted for about 21.5 million pounds or 70 percent of the total production.

lower prices are now selling at close to the top of the market. (Australian Fisheries Newsletter, October 1964.)

Note: See Commercial Fisheries Review, December 1963 p. 54

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ARTIFICIAL CULTIVATION OF SPINY LOBSTER TO BE TRIED:

An attempt to breed and artificially cultivate spiny lobster in Western Australia is being considered by private enterprise. A proposal has been submitted to the Western Australian Department of Fisheries to build a fish farm on the coast. It involves the excavation of a pool with stone retaining walls which will contain ledges and caves at various depths for spiny lobster. It is planned to introduce other marine life and to supply sea water through a pipe by gravity feed.

Fisheries Department research officers consider it will be difficult to induce spiny lob-

Australia (Contd.):

ster to spawn in an artificial pond, but believe that the young ones may survive and grow if artificially fed.

Shrimp farming, using artificial propagation methods, has been successfully developed in Japan, but it has taken many years of research to develop the techniques. (Australian Fisheries Newsletter, September 1964.)

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NORTH QUEENSLAND SHRIMP BEDS PRODUCTIVE:

Shrimp beds in the Burdekin Estuary area of North Queensland, Australia, yielded good catches of shrimp in September 1964. Six vessels were working the area and the shrimp were marketed from Mackay to Cairns. Daily catches of more than 3,000 pounds were landed at Townsville. The North Queensland Fish Marketing Research Authority has been asking for local surveys by local vessels in an endeavor to discover more shrimp beds in North Queensland. (Australian Fisheries Newsletter, September 1964.)

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SHRIMP RESOURCES IN NORTHERN WATERS SURVEYED:

A two-year survey of the shrimp fishery potential of the Gulf of Carpentaria on Australia's north coast was approved in 1962 for expenditures of up to £25,000 (US\$56,000) from Australia's Fisheries Development Trust Account. The survey was to be conducted jointly with the state government of Queensland.

A survey vessel has been operating in the Gulf of Carpentaria for nearly 12 months and a considerable amount of data on the occurrence of various species of shrimp has been collected. The data have given several interesting leads as to the best method of continuing efforts in the Gulf to locate commercial quantities of the various shrimp species.

The Australian commercial fishing company which has established shore-processing facilities in the area has been working in close cooperation with the survey. Commercial catches have been made on a scale which would, if sustainable, indicate a major shrimp fishery. But the very great area to be covered and the limitations in using only one ves-

sel have not made a definitive assessment of the shrimp resource possible.

The supervising committee, in making a review on progress of the survey, concluded that although the survey vessel has caught shrimp in commercial quantities on only a few occasions, encouraging evidence of abundance of banana and tiger shrimp has been obtained. The knowledge which has now been acquired from the survey indicates commercial success in 1965. (Australian Fisheries Newsletter, September 1964.)

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FOREIGN TRADE IN FISHERY PRODUCTS, FISCAL YEAR 1963/64:

Exports: The value of Australian exports of fishery products in fiscal year 1963/64 (July 1963-June 1964) rose to a record A£8,266,000 (US\$18,350,520), according to preliminary data. That was an increase of 12 percent from the previous fiscal year. The main reasons for the increase were improved prices for Australian spiny lobster tails in the United States, expansion of the scallop market in France, and an increase in frozen tuna exports to the United States.

Shipments to the United States accounted for 64 percent of total Australian exports of fishery products in 1963/64, shipments to France and Japan each accounted for 11 percent, and shipments to the United Kingdom accounted for 6 percent.

The increase in United States spiny lobster prices was largely the result of a significant fall in United States spiny lobster inventories. On June 30, 1964, those were estimated at 3.5 million pounds, which was 47 percent lower than in June 1963. (Editor's Note: United States cold-storage holdings of spiny lobsters on September 30, 1964, were about 2.6 million pounds as compared with 5.1 million pounds on September 30, 1963. In the first 8 months of 1964, United States imports of frozen spiny lobsters included 7.6 million pounds from Australia, 8.6 million pounds from the South Africa Republic, 1.9 million pounds from New Zealand, 1.8 million pounds from Brazil, and about 5.3 million pounds from other countries. During January-August 1963, United States imports of spiny lobster tails included 8.2 million pounds from Australia, 7.0 million pounds from the South Africa Republic, 2.2 million pounds from New Zealand, 2.7 million

Australia (Contd.):

pounds from Brazil, and about 4.1 million pounds from other countries.)

Australian shrimp exports in 1963/64 went to Japan, the United States, and South Africa.

It is estimated that more than 750,000 pounds of scallops valued at about A£185,000 (\$410,700) were exported from Australia in 1963/64, of which 655,000 pounds went to France, and the balance to Belgium, the United Kingdom, and New Caledonia.

Imports: The value of Australian imports of fishery products in fiscal year 1963/64 was 24 percent above that in the previous fiscal year. The largest increase was in imports of fresh and frozen fish, the bulk of which was South African hake, and British bream and cod packed in 1-pound and 5-pound cartons.

Australian Imports of Fishery Products, Fiscal Year 1963/64				
Item	Value			
	1963/64		1962/63	
	A£ 1,000	US\$1,000	A£1,000	US\$1,000
Fresh and frozen fishery products.	5,187	11,515	3,822	8,485
Canned fishery products	4,683	10,396	4,039	8,967
Other fishery products	1,221	2,711	1,070	2,375
Total	11,091	24,622	8,931	19,827

In fiscal year 1963/64, Australian fishery imports exceeded fishery exports in value by 34 percent. (Australian Fisheries Newsletter, September 1964.)

Notes: (1) See Commercial Fisheries Review, Oct. 1964 p. 51.
(2) Australian pound 1.00 equals US\$2.20.



Canada

HERRING FISHING IN BRITISH COLUMBIA HALTED BY PRICE DISPUTE:

British Columbia herring fishing was halted in late October 1964 by a price dispute. The tie-up came a week after the expiration of the 1963/64 Herring Price Agreement between British Columbia fishermen and processors. Before the tie-up began, processors were reported to have offered fishermen C\$14 (about US\$13) per short ton for reduction herring, or C\$1.60 (US\$1.48) more than the C\$12.40 (US\$11.48) paid for British Columbia herring going into reduction during

the 1963/64 season. The processors also offered to contribute to a medical plan for fishermen during the coming season. (Editor's Note: Ex-vessel prices for herring in British Columbia are not comparable to prices in certain other countries, because British Columbia processors furnish much of the equipment used in the fishery.)

Note: US\$1.00 equals Canadian \$1.08.

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FISHERIES MINISTER REPORTS TO PARLIAMENT ON FISHING INDUSTRY PROGRESS IN 1964:

Canada's commercial fishery in 1964 was generally satisfactory, according to the annual report given by the Canadian Minister of Fisheries to Parliament, September 23, 1964. The spring salmon fishery in British Columbia yielded 4.9 million pounds in the first 6 months of 1964 as compared with 3.6 million pounds for the same period in 1963. For the first 7 months in 1964, landings of all species by Canada's commercial fishermen on both coasts totaled 1.2 billion pounds--30 million pounds more than in the same 7 months a year earlier. Despite the overall increase, cod landings from Newfoundland's trap fishery were below 1963 and contributed to a 48-million-pound decline in Canadian landings of that species.

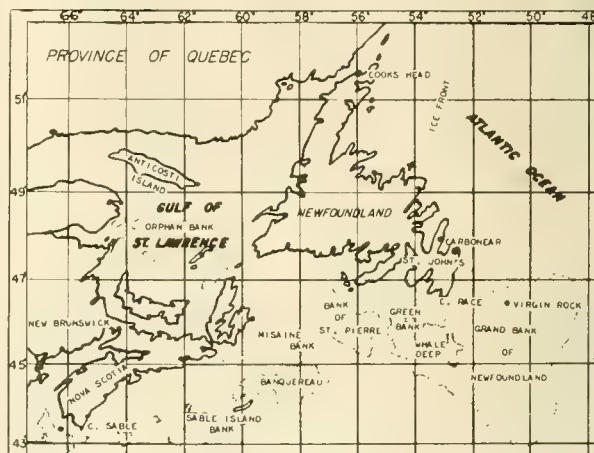


Fig. 1 - Canadian fishermen are close to rich fishing banks off the Atlantic Coast.

In his annual report to Parliament, the Minister of Fisheries said, in part:

"The value of the commercial catch is larger so far this year than the increase in landings would suggest. The increase in value to the end of July was about 20 percent against 2 percent increase in the volume of landings. This is accounted for principally by a high-

Canada (Contd.):

er proportion of the more valuable species in the total catch. In British Columbia, salmon landings are up by 34 million pounds, and in the Atlantic provinces there have been significant increases in the landings of haddock, small flat fish, swordfish, and scallops....

"This expansion in output at the primary level of the industry occurred without any softening of dockside prices. In fact, in some cases the price level moved up over the record level set a year ago....



Fig. 2 - "Seining the weir" (concentrating the fish into a mass by gradually decreasing the net space) in a 60-foot sardine weir off the Atlantic Coast.

"In the Maritime Provinces the expansion in production and quality of swordfish and tuna, the last just a two-year-old industry, continues.... The United States is the predominant market for these special species. This year the value of scallop landings is up by C\$900,000 and swordfish by \$600,000 over the last season....

"The halibut catch, however, has been disappointing, especially from area 2, but prices have firmed up considerably from last year....

"The value of exports to the end of June indicates a continuing strong demand for fishery products from this country. For all products, this figure for the six months period was C\$88 million, compared with \$72 million to the end of June 1963. The United States continues to be the largest customer in this field and Canadian exporters sold \$58 million worth out of the \$88 million total to markets in the United States.

"The demand for groundfish products continues without abatement....

"The strong demand for Canadian fishery products, and especially that associated with the growing population on this continent, has been accompanied by firm or rising prices. This situation has been apparent for

several years.... The Atlantic fleet now includes 92 trawlers, most of which are modern and efficient. Five years ago this fleet comprised 53 vessels. This is an increase of 80 percent, and most of the 53 were used ships which had been purchased from the United Kingdom and the United States. The scallop fleet now contains about 35 vessels over 75 feet in length, capable of exploiting distant beds and landing scallops of high quality. Five years ago there were only 9 scallop vessels of this size on the Atlantic coast. Fishermen, alone or in partnerships, are acquiring vessels in the 45- to 65-foot class which fish near and middle distance waters. They are equipped with modern fish-location and catching gear, and their owners are actively experimenting with new types of gear and new methods of fishing. Nearly 500 of these vessels have been purchased by fishermen with financial assistance provided by the Department of Fisheries in recent years.

"Significant advances have been made by industry in providing facilities to increase their processing capacity and to expand the variety of fish and shellfish products available to an increasingly quality conscious public.... Complementary to the development program for improved product quality at the processing level has been the Department's work in the fields of fish-boat inspection and dockside grading. As an outcome of the Federal-provincial conference on fisheries development, which pointed to the need for improvement in the quality of fish as landed, more emphasis has been placed on these aspects of inspection. Regulations are being developed for adequate sanitation and handling methods on fishing boats. Educational material is being prepared for the assistance of fishermen in handling and caring for their catch, and also for those handling fish at the retail level.



Fig. 3 - Irish moss is harvested on parts of Canada's Atlantic Coast. Raked up from the sea, the seaweed is spread to dry on flakes (wooden racks).

"The Department's laboratories are responsible for the inspection of domestic and imported canned fish; experimental work on the development of new and improved standards for canned and other types of fish; shellfish toxicity control programs; the bacteriological control of fresh and frozen shellfish plants and the purity of plant water supplies. These services are provided by permanent or mobile laboratories as the need dictates....

National Fisheries Development Program: In speaking of Canada's national fisheries development program, the Minister said, "I have already mentioned in this house our national fisheries development program, the basis of which was set up at a Federal-provincial conference on fisheries development which I convened in Ottawa last January (1964). I explained, too, that this

Canada (Contd.):

was also a forum for the views of industry as well as of Government, since briefs were received at that time from the Fisheries Council of Canada and from fishermen's representatives from various areas.

"The progress made as a result of this conference is quite heartening, and I think this is the proper time and place to report on it. A number of projects are now well under way as cooperative efforts between Federal and provincial administrations. These include the following:

"1. The development and demonstration of trawls suitable for rough bottom, so that our Canadian fishermen can exploit grounds now being actively fished by foreign vessels.

"2. The modification of small boats for inshore dragging and introduction of Japanese-type mechanical squid jigging equipment--this is in the Newfoundland area.

"3. Demonstration of the construction and operation of the western or Pacific trawl in Nova Scotia and New Brunswick waters.

"8. Experimental and development work in Quebec on fish-finding gear towed by helicopter.

"9. The development and introduction of improved lobster processing line techniques in Quebec plants.

"10. Work in collaboration with ARDA on a project to improve the inshore fishery in northeastern Newfoundland.

"During the conference it became obvious that there was a need for regional Federal-provincial committees similar in concept to the Federal-provincial Atlantic fisheries committee which was established in 1958 to coordinate programs for fisheries development, and the Federal-provincial committee for Ontario fisheries. Consequently we now have a Federal-provincial committee for British Columbia fisheries and a Federal-provincial prairie fisheries committee. All these Federal-provincial regional committees are of inestimable value in that they constitute formal consultative bodies which can discuss and deal with questions of common interest such as marketing, research and fisheries management generally. A sport fishery advisory committee has also been established in British Columbia. . . .

"Restriction of entry into the lobster fishery has been considered at regional Federal-provincial meetings; so has the subject of limitation of entry into the Pacific



Fig. 4 - New fish-processing plant in Lunenburg, Nova Scotia. Designed to efficiently handle fish by a system of conveyor belts from the vessel unloading pier to the final freezing of the packaged processed fish products. Vessel unloading facilities are completely enclosed.

"4. The charter of a Norwegian whaling vessel, with her crew, to learn and to demonstrate the possibilities of reviving the whaling industry on the Atlantic coast.

"5. The improvement of trawling operations for groundfish off the Pacific coast.

"6. A survey is being made of the Irish moss resources in New Brunswick and Prince Edward Island and a few days ago I made the announcement that a site had been selected on Prince Edward Island for the construction, with assistance from the Atlantic development board, of an Irish moss drying plant.

"7. The exploration of a new scallop bed off Shippegan gully.

salmon fisheries, and there have been discussions on fish farming, in particular, with respect to commercial trout farms. A good deal of background material on this subject has been prepared and these matters are under active consideration.

"The control of pollution of our waters remains a subject of vital interest and much information has been collected. The fisheries research board has been in consultation with the national research council concerning the establishment of an intergovernmental committee on pollution to ensure the availability of complete information. It is hoped that work on salt-water pollution in the Atlantic region can be started and that the work already carried out on the Pacific coast can be strengthened.

Canada (Contd.):

"Discussions have taken place with the Department of Labor and with provincial authorities on vocational training and education for fishermen, and my department is creating an educational unit to coordinate activities in this connection.

"Then again, as a result of recommendations made during the Federal-provincial conference, a fisheries-related approach to improvements in harbor works has been discussed with the Department of Public Works and the Atlantic development board. Discussions have also taken place with the Department of Finance concerning improvements to the Fisheries Improvement Loans Act. The provincial authorities and the industry are being asked for their views concerning credit facilities for fishermen and possible inadequacies in the existing legislation."

Other Federal Government Fisheries Projects: In reporting to the Parliament on other Canadian Federal Government fisheries projects, the Minister said, "In addition to the programs already mentioned, many other industrial development projects are under way. Powered gill-net haulers are being introduced, synthetic cod gill nets are being tested in areas where they have not been used, and we are experimenting with synthetic materials for cod trap construction. We are also working on a prototype of a mechanized gill-net boat capable of multipurpose fishing operations, and we have introduced porbeagle shark fishing gear and techniques in the Atlantic provinces.

"Modern methods of seining herring in western and southern Newfoundland also are being demonstrated to ascertain the commercial potential of such operations in those areas. New techniques in salt-fish drying, using high-speed equipment developed in the department, are being demonstrated on a commercial scale for the benefit of industry, and we are producing, on a pilot plant basis, commercially acceptable instant fish-potato flakes.



Fig. 5 - A Canadian West Coast purse-seiner sailing out to seek the schools of salmon.

"We are working on a design of a deep-sea stern ramp trawler to meet the specific Canadian requirements for groundfish trawling operations and are experimenting with an electrical trawl.

"In Nova Scotia we are studying the distribution and abundance of herring, whiting, argentines, and sand lance, which are species of small fish not yet exploit-

ed by Canadian fishermen. The object is to develop offshore trawling gear and techniques so that this situation may be remedied. Scottish methods of Danish seining are being tested to increase the efficiency of this technique, and we are hoping to develop a distant-water tuna fishery, using large seine boats.

"A new and promising design for a plastic lobster trap is being tried out on a commercial scale in Prince Edward Island where we also hope to encourage offshore herring seining methods, like those used in Iceland, in order to meet European orders for frozen herring. We are aware of the great potentialities of fishing for pelagic fish in the Gulf of St. Lawrence and we are prepared to meet this challenge. Crab fishing operations are under way in the Northumberland strait, and we are hoping that a crab fishery can be developed around the Magdalen and Anticosti Islands. We anticipate good results from a manually operated hydraulic clam digger developed by the fisheries research board for clambeds in the maritimes.

"In British Columbia one of our aims is to diversify fishing operations off the Pacific coast by the introduction of better trawling operations for groundfish, and we are working on an improved refrigeration system for use in the halibut fishery in distant areas."

Fishing Limits: Referring to the establishment, on July 23, 1964, of a 12-mile fishing zone around the coasts of Canada, the Minister told the House the next step was the establishment of straight base lines from which the 12-mile fishing zone and the territorial limits would be measured. They are now measured from the contour of the coastline.

Eight other countries, the Minister pointed out, have been fishing off Canada's coastline for some time and discussions were being held with those countries to see how their interests might be affected. Those discussions were in their second round as of late September 1964 and the Minister hoped for their early conclusion so that new base lines could be established without delay. (Canadian Fisherman, November 1964.)

Note: See *Commercial Fisheries Review*, November 1964 p. 79; October 1964 p. 52; March 1964 p. 42; January 1964 p. 44.

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DOME-SHAPED LOBSTER TRAP DESIGNED WITH UNIQUE FEATURES:

A new dome-shaped "igloo" lobster trap made of plastic has been developed by the Markland Works, Ltd., Amherst, Nova Scotia. That firm was set up for the sole purpose of manufacturing and marketing the new trap. A large-scale test of the new trap is scheduled in fishing areas off Prince Edward Island. Preliminary tests in the lobster fishery have already been carried out; tests in the west coast crab fishery of British Columbia have also been conducted.

The new plastic traps are expected to have an effective working life of from 8 to 10 years. In addition, it is claimed that their shape and weighting make them more stable on the sea bottom than other traps.

Canada (Contd.):

The polyethylene plastic material in the new traps will not rot or waterlog and is not attacked by marine borers or other forms of sea life. In the water, it has the same smooth resilient feel as kelp, a natural sea plant on the lobster grounds. Polyethylene used in the traps is pigmented to reduce the danger of sunlight degradation when the traps are stored in the off-season.

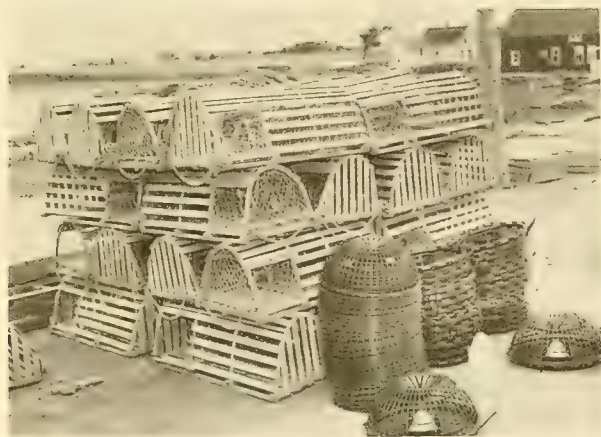


Fig. 1 - New plastic "igloo" lobster traps compared with conventional wood-and-twine traps. Here, 32 of the new compact traps are piled in front of the same number of conventional traps. That number of new traps occupies the same space as four conventional traps. White objects are bait boxes for the new traps.

The trap is dome-shaped--hence the name "igloo"--with a vertical entry for the lobster. This design gives the trap greater bottom sta-



Fig. 2 - Plastic traps are loaded on lobster fishing vessel at Victoria, P.E.I., Canada. The "igloo" traps snap apart easily for storage, and can be assembled in seconds. They are weighted with a coated iron ring which helps them sit firmly on the bottom.

bility and allows lobsters direct access to the entry from any direction of approach. The entry itself is at the top of the dome and closer to the bait than any other point in the trap.

The entry consists of thin fingers of polyethylene leading into the trap. The fingers are resilient and can easily be spread apart by a lobster attempting to enter. When the lobster is inside, however, the fingers spring back into place closing off the entry. The opening can be spread to nine inches to trap much larger lobsters than present traps. Once the lobster is in the new trap, it stays in. There is no chance for it to spread the fingers from inside and escape. A small exit port is left in the side to allow undersized lobsters to escape.



Fig. 3 - Lobster fisherman assembles an "igloo" trap on the way to the lobster grounds. The traps have a twist-on bait box that can take whole fish bait or mashed or chopped fish waste. The bait box prevents groundfish or crabs from stealing the bait before the trap can attract lobsters.

The "igloo" trap also has a specially designed quick-release bait container, made to hold either whole or mashed bait. The new bait box allows fishermen to use cheap fish trimmings and other low-cost bait. It also prevents fish from eating the bait before it has a chance to attract lobsters.

"Igloo" traps come in four sections which can easily be fitted together. The base section has a mild steel weight ring snapped into it with a tow eye welded to the ring. The steel ring is coated with epoxy plastic to prevent rusting and the tow eye is made of a special salt-water-resistant steel. The bait box snaps into the center of the base and twists on so that it is securely fastened. The dome-shaped body of the trap twists onto the base and is held by mating lugs. The top section with the

Canada (Contd.):

entry port is hinged to the body and closes with two latches.

Each part can be nested separately when transported and a trap can be baited and assembled in seconds. The nesting feature will allow a standard Canadian lobster boat to place 300 to 350 "igloo" traps without returning to port for another load.



Fig. 4 - Lobster fisherman throws an "igloo" trap overboard. Weighing 25 pounds, the plastic traps are lighter than conventional traps which can weigh up to 100 pounds when water soaked. The new traps weigh about the same as the wooden traps on the bottom, 19 pounds, because of their lower buoyancy. The iron ring at the base distributes the weight around the circumference of the "igloo" trap giving it stability on the bottom.

"Igloo" traps weigh 20 to 21 pounds on the bottom and 25 pounds in air, compared to 20 to 25 pounds on the bottom and up to 100 pounds in air for conventional traps. The top and bait box of an "igloo" trap open in seconds for baiting. When the lid is open there is ready access to the catch.

Because of their dome shape and ballast arrangement, the new traps settle in an upright position on the seabed. The slight buoyancy of the plastic keeps the top upright as the traps settle. (DuPont of Canada, Ltd., November 1964.)

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EXPERIMENTAL OYSTER HATCHERY OPENED ON PRINCE EDWARD ISLAND:

Canada's first experimental oyster hatchery was officially opened in the summer of 1964 at Ellerslie, P.E.I., on the east coast. The hatchery, operated by the Canadian Federal Department of Fisheries, is designed to spawn oysters at any time during the year and to raise young oyster larvae to the stage where they settle down on the sea bottom as spat. The main purpose of the new facility is to produce spat in sufficient quantity to supply the oyster industry.

Spawning at the new hatchery is regulated by careful control of salinity, temperature, and other conditions. For example, the water in oyster tanks is heated in the winter and, at times, cooled during the summer.

The new hatchery also has an oyster-breeding program designed to improve growth, shape, flavor, and other characteristics of Atlantic oysters. Exotic species of oysters living in locations where commercial oysters cannot survive will also be tested in the hatchery.

While the study and raising of oysters are the main concerns of the hatchery, it will also study related subjects. For instance, oyster scientists are taking a closer look at eel grass, a marine flowering plant which is a serious menace in some oyster-growing areas. Methods for its control are being sought. The effects of pollution on oysters are also under study. Scientists at the hatchery are also seeking methods to control shipworm, a species of shellfish which attacks hulls of wooden vessels and other wooden structures in water.

Speaking at the opening of the new hatchery, the Canadian Federal Minister of Fisheries said there was every reason to give the Canadian oyster industry technical support to help it expand. He recalled the heavy mortalities suffered by Prince Edward Island oyster stocks more than 40 years ago when an epidemic struck the beds. Research scientists took over the problem and were able to use isolated pockets of resistant stocks to bring back the industry to the island.

The Minister also recalled the epidemic which devastated oyster beds in New Brunswick and Nova Scotia within the last decade. Quick action was taken by the Federal Department of Fisheries and more than 10,000 barrels of disease-resistant island oysters were transplanted in the affected areas on the mainland. "In general," he said, "these oysters lived and grew in the new areas, and they produced spat which in most cases was resistant, and the industry is now rebuilding."

The Minister declared that if the industry was to expand, it would have to be mainly through leased fishing areas where beds can be properly seeded and cultivated, and a top quality product harvested. (Canadian Trade News, September 1964.)

* * * * *

NEW RESEARCH VESSEL "E. E. PRINCE" TO BE BUILT FOR ATLANTIC INVESTIGATIONS:

A contract to build a million-dollar research vessel for Atlantic fisheries investigations has been awarded by the Canadian Federal Department of Fisheries to a shipyard in the St. Catharines, Ontario, area. The contract calls for a 130-foot vessel with a range of 3,000 miles and a cruising speed of 11 knots. The vessel will be equipped for stern trawling and scallop dredging. It will have a 27-foot beam, a draft of $10\frac{3}{4}$ feet and a complement of 21 including scientists and crew.

The new research vessel will be named the E. E. Prince after the late Professor Ernest E. Prince, who was the first chairman of the

Canada (Contd.):

Biological Board of Canada, which later became the Fisheries Research Board.

The E. E. Prince will have an antirolling flume-stabilization system to help steady the vessel while operating at sea; it will also have a bow-thruster installed well below the low-water line to aid slow-speed maneuvering.

The all-welded steel hull of the vessel will be strengthened for navigation in ice, and the deckhouse and wheelhouse amidships will be of aluminum. Propulsion machinery will be amidships. The fish hold and fishing gear will be located on the upper deck aft, which will be wood-sheathed.

Hinged gallows of special design will be installed for lowering and retrieving trawls. Two hydraulic trawl winches, each capable of exerting a pull of 4 tons at 240 feet per minute, will be fitted to operate in synchronization or independently as required. A winch for taking oceanographic samples will also be installed. Navigational aids to be installed include 2 radar sets, gyro compass, automatic pilot, 3 echo-sounders, and radio-navigational systems. The propulsion machinery will consist of a 600-horsepower Diesel engine coupled to a 4-blade controllable-pitch propellor. Electric power will be provided by three Diesel-driven generators. (Canadian Department of Fisheries, November 23, 1964.)



Chile

TUNA EXPORT INDUSTRY PLANNED:

To develop an export tuna industry, Chile is building a modern fish canning and freezing plant at Iquique. The Government-owned plant is expected to process between 25,000 and 30,000 metric tons of tuna, bonito, and sardines annually (mostly for export). The anticipated opening of the new plant has been delayed; it will probably not be in operation before the first quarter of 1965. The new plant, with its 3 automatic canning lines, will be capable of an annual production of 400,000 cases of tuna (48 1/2-pound tins) and 360,000 cases of Spanish sardines (48 1-pound tins). The cold-storage capacity of the new plant will be 100,000 tons of fish; freezing facilities will consist of a blast-freezing room and a brine-freezing installation. The new enterprise also includes a fish meal plant which began operating in June 1964.

The supporting fleet for the new plant will be composed of 8 tuna vessels and 9 anchoveta vessels. The anchoveta fleet is already working. The first vessel of the tuna fleet, the 170-ton Santa Rosa, started fishing in December 1962. (The company has used the cold-storage facilities of another plant to process frozen tuna and bonito from the Santa Rosa for export.) Two 310-ton vessels, acquired from Great Britain, were expected to join the Santa Rosa in late 1964. Five

110-ton purse seiners were ordered from German shipyards for the tuna fleet. Those vessels are scheduled for completion and delivery in late 1964.

Organized by the Production Development Corporation of Chile (CORFO), the new company at Iquique will be Chile's first modern fish canning-freezing plant. Chile tightened its control of fishing permits to foreign tuna vessels, with the idea of maintaining adequate resources for its own tuna industry. The Government is also concerned over the proposed yellowfin tuna conservation program of the Inter-American Tropical Tuna Commission.

The new Government-owned cannery at Iquique will bring mechanization to the Chilean fish canning industry. The four relatively small canneries now in operation in north Chile produce for the domestic market. None is fully automatic and only one has refrigeration facilities. However, those plants produce all the tuna and bonito and about 40 percent of the sardine and salmon-type fish canned in Chile. (United States Embassy, Santiago, October 29, 1964.)

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FISHERIES TRENDS, THIRD QUARTER 1964:

Landings of anchoveta from Chile's northern waters were rather light during July-September 1964 (usually considered an off-season period), but were considerably improved compared with the same period in 1963 when the anchoveta virtually disappeared from those waters. But the fish caught during the 1964 season were thin and their oil content very low. Although fish supplies were low, most industrial products plants continued to operate during the period.

Some of the larger vessels of the anchoveta fleet fished off Mejillones, a fishing area of the Antofagasta canneries. This incursion into that area by those larger anchoveta fishing vessels was protested on the grounds that some of the commercial species taken by them were too valuable to use for fish meal.

Chile's anchoveta landings in the first half of 1964 exceeded total landings of that species in 1963. By the end of 1964, the fish reduction industry of northern Chile will have installed a production capacity nearing 900 metric tons of raw fish per hour. The 1964 export value of fish meal and fish oil was expected to amount to some US\$30 million.

The frozen shrimp and langostino industry of central Chile is expanding its processing facilities as well as modernizing them. Within the next year there should be a substantial increase in exports of frozen shrimp and langostino (baby rock lobster-type meat). Two new plants are under construction and three existing plants are installing new processing lines. The plants have modernized

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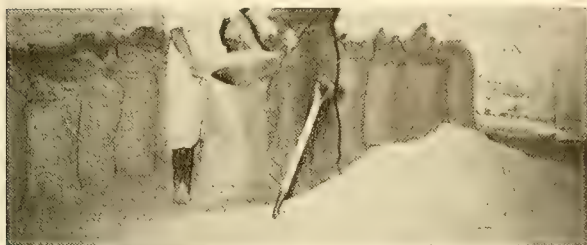
their facilities and have better handling procedures in order to improve and increase production. (United States Embassy, Santiago, October 21, 1964.)

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FISH MEAL AND OIL PRODUCTION ESTIMATE FOR 1964 AND OUTLOOK FOR 1965:

The dynamic development of the fish reduction industry in northern Chile over the last few years has placed Chile among the major fishing nations of the world. The reduction industry in northern Chile represents a capital investment of around US\$75 million. Chilean output could reach 455,000 metric tons of fish meal and 60,000 tons of fish oil in 1965.

The Chilean industry has been going through some readjustment. The explosive expansion of late 1962 and early



Fish meal being put in bags at a plant in San Antonio, Chile.

1963 was arrested by an almost complete disappearance of anchoveta from Chilean coastal waters from June through November 1963. Speculative and inexperienced capital was frightened out of the industry. The more sober pace of present growth offers greater assurance of a strong Chilean reduction industry.

Plant Capacity: As of July 1964, a total of 24 Chilean reduction plants were in operation in the northern Province of Tarapaca with a combined capacity of some 680 metric tons of raw material per hour. Twelve of those plants went into production during the first half of 1964. Under construction in Tarapaca in mid-1964 were 12 new plants and 7 new lines in existing plants. The facilities being built should boost the capacity of the Chilean reduction industry to about 1,200 tons of raw material per hour by 1965.

Production: In 1963, northern Chile produced 93,000 metric tons of fish meal and 12,300 tons of fish oil which represented 86 percent and 98 percent, respectively, of the total production of the country. The entire output of northern Chile was sold on the world market. Production in the first 6 months of 1964 amounted to 110,000 tons of fish meal and 13,600 tons of fish oil. Assuming 80 days of normal operations for the last half of 1964, production for the year should total some 255,000 tons of fish meal and 35,000 tons of fish oil. At prevailing prices, that production would have a total export value of \$30 million to \$35 million. In 1965, production could reach 455,000 tons of meal and 60,000 tons of oil. At prevailing prices, its value on the world market would amount to some \$55 million to \$60 million.

Fishing Fleet: The supporting anchoveta fleet of north Chile numbered 205 vessels as of July 15, 1964, an increase of about 100 vessels within the year. With few exceptions the fleet is composed of modern steel purse seiners having a hold capacity of 100 to 170 tons and equipped with echosounder, radiotelephone, power block, anchor winch, and a

Diesel-powered skiff. Many of the larger craft have fish pumps for emptying the nets.

The fleet is supported by a group of spotter planes which effectively cover the 200 miles of coastline from Arica to Iquique. Several planes are being used to direct net setting and hauling.

Anchoveta Catch: The northern fleet of Chile increased its catch of anchoveta (*Engraulis ringen*), the commercial fish of the reduction industry, from 438,000 metric tons in 1962 to 538,000 tons in 1963 (in spite of an almost complete disappearance of anchoveta from Chilean coastal waters for approximately 6 months in 1963). Landings in the first 6 months of 1964 reached 608,000 tons, a 55 percent increase over the catch during the same period of 1963. However, to support normal operations of the expanded reduction industry, the fleet must bring its total take for 1964 to 1,450,000 tons of fish. Installed plant capacity in 1965 will require between 2.3 million and 2.5 million tons of fish. If anchoveta are within reach, the present fleet is considered capable of supporting the normal production of existing plants. In 1965, a fleet of 250 to 275 vessels will be required to adequately supply the installed capacity.

Costs: Production costs have increased over 1963, but (with the very favorable world market for both fish meal and fish oil) earnings appear to be substantially better. In the Arica and Iquique zones, the cost of producing fish meal is around \$80 to \$90 per ton. The landed cost of the anchoveta continues around 10 percent of the f.o.b. value of fish meal. The October 1964 price of fish meal was \$125 f.o.b. Chilean ports.

Exports: The fish reduction industry of north Chile has been developed for the export market. (Domestic requirements of some 23,000 tons of fish meal are supplied by the higher-cost producers of south central Chile.) Chile's exports of fish meal in 1963 totaled 86,800 tons valued at \$9.3 million as compared with fish meal exports of 41,500 tons valued at \$3.5 million in 1961. Fish oil exports in 1963 totaled 11,800 tons valued at \$1.3 million bringing exchange earnings of the fish reduction industry to \$10.6 million. Plants outside north Chile contributed only 3 percent of the total export value.

Shipments of fish meal from Chile in the first 6 months of 1964 reached 77,600 tons with a value of \$8.2 million. A substantial amount of oil was awaiting shipment as of July 1964. If the supply of fish was adequate to maintain normal operations, exports in 1964 could reach 200,000 tons of meal and 30,000 tons of oil with a total value of \$25-30 million.

In 1965, the fish reduction industry of north Chile will have the plant capacity to support an export trade of some 400,000 tons of meal and 60,000 of oil, which at present prices would yield an exchange earning of approximately \$55 million.

The United States was Chile's best market for fish meal in 1963, but was replaced by West Germany during the first half of 1964. The Netherlands, Belgium, and Great Britain are the other principal markets. Venezuela was a strong purchaser in 1963. France and Italy increased their purchases substantially during the first 6 months of 1964. All fish meal is sold f.o.b. Chilean ports. The export price of fish meal averaged \$107 a ton in 1963; the price in October 1964 was around \$125. The trade expected prices to hold steady for the balance of 1964. Shipment is made in both jute and paper bags. Eventually some meal will be shipped in bulk.

The Netherlands continues to be Chile's principal market for fish oil (over 80 percent of the total exports of fish oil went to that market in 1963). The export price of fish oil averaged \$110 a ton in 1963, but in October 1964 ranged between \$150 to \$175 a ton. All shipments are made in bulk. (United States Embassy Santiago, October 29, 1964.)



Ghana

FOREIGN-BUILT TRAWLERS RECEIVED:

Delivery of the first of 7 large stern trawlers ordered from Norway by Ghana was formally accepted recently by the Board chairman of the government-controlled Ghana Fishing Corporation. Delivery ceremony for the 231-foot trawler Shama was at a West Norway shipyard.

The vessel has a deep-freeze capacity of 24 tons of fish a day, and 35,000 cubic feet of refrigerated storage space. It is Diesel-powered by engines generating 1,960 b. hp., coupled to reversible propellers; is capable of 14.5 knots; and can carry fuel for 60 days. Four of the other trawlers on order at Norwegian shipyards have already been launched, with 2 more vessels to be built.

Meanwhile, a group of 17 Ghanaians has begun intensive training in Oslo to qualify as engineers on the trawlers. The 11-month course, which started the middle of October 1964, includes elementary engineering and apprentice service at Norwegian shipyards. It is a part of a program, as yet to be formally worked out and approved, under which the Norwegian Agency for International Development (NORAD) will assist in training Ghanaian engineers and deck officers for the trawler fleet.

According to present plans for the projected cooperation between Ghana and Norway, NORAD will supply four instructors and special equipment for a maritime school to be established at the port of Tema in Ghana. Government authorities will provide the site, buildings, and some of the equipment, besides carrying part of the operating cost. The school will be jointly run for three years, and then transferred to local authorities in Tema. (News of Norway, November 12, 1964.)



Six stern trawlers are also being built at a shipyard in Wales, Great Britain, for the Ghana Fishing Corporation. These will be fitted with six-cylinder Diesel engines rated at over 2,000 b. hp.

Another new fishing trawler, the Sushion, was delivered to the state-owned Ghana Fishing Corporation in October 1964. The 176-foot trawler (644 gross tons) was built by a Soviet shipyard at Kiev and has a maximum fish-holding capacity of 140 metric tons.

Ghana is in the process of building up a large modern trawler fleet. The state-owned Fishing Corporation now has 8 trawlers, and 12 additional trawlers for the corporation are on order by the government. Ghana also has received the second of a group of 236-foot stern trawlers of 1,850 gross tons ordered from Japan. The order to the Japanese shipyard includes two fish carriers of 1,200 dead weight tons each. Ghana's vessel order to the Japanese shipyard is reported valued at about US\$16 million, the largest ever received from an African nation. World

Fishing, October 1964, and other published and unpublished sources.)

Note: See Commercial Fisheries Review, December 1964 p. 94; October 1964 p. 57 March 1964 p. 54.



Iceland

EXPORTS OF FISHERY PRODUCTS, JANUARY-AUGUST 1964:

During January-August 1964, there was an increase in exports of salted fish (uncured), frozen fish fillets, cod-liver oil, fish meal, and herring meal as compared with the same

Product	Jan.-Aug. 1964			Jan.-Aug. 1963		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	728	18,425	427	1,423	28,594	663
Salted fish, uncured	22,662	350,945	8,142	17,492	220,506	5,116
Salted fish fillets	1,001	14,424	335	921	11,498	267
Wings, salted	1,173	14,765	343	1,504	18,484	429
Stockfish	5,821	158,872	3,686	3,802	102,619	2,381
Herring on ice	19	140	3	7,224	23,417	543
Other fish on ice	20,547	118,811	2,756	19,762	101,862	2,363
Herring, frozen	14,415	85,873	1,992	25,733	142,139	3,298
Other frozen fish, whole	2,248	21,503	499	2,151	22,554	523
Frozen fish fillets	39,163	782,481	18,154	37,903	696,227	16,152
Shrimp and lobster, frozen	842	77,381	1,795	377	37,518	870
Roes, frozen	1,251	20,633	479	736	12,027	279
Canned fish	180	9,764	227	121	7,193	167
Cod-liver oil	7,748	70,097	1,626	6,006	42,280	981
Lumpfish roes, salted	417	10,513	244	313	5,140	119
Other roes for food, salted	2,635	39,370	913	3,176	44,919	1,042
Roes for bait, salted	2,421	20,131	467	1,745	12,571	292
Herring, salted	17,815	185,130	4,295	24,450	245,063	5,685
Herring oil	21,030	164,005	3,805	22,283	94,694	2,197
Ocean perch oil	28	188	4	116	515	12
Whale oil	2,812	23,944	556	2,887	19,157	444
Fish meal	24,403	151,717	3,520	8,465	48,232	1,119
Herring meal	53,636	314,661	7,300	42,190	253,272	5,876
Ocean perch meal	976	5,703	132	2,163	10,097	234
Wastes of fish, frozen	3,875	11,888	276	2,722	7,794	181
Liver meal	407	2,690	62	371	2,563	59
Lobster and shrimp meal	129	475	11	-	-	-
Whale meal	1,211	6,694	155	100	558	13
Whale meat, frozen	1,809	14,395	334	1,961	13,518	314

Note: Values converted at rate of 1 krona equals 2.32 U.S. cents.

period in 1963, according to the Icelandic periodical Hagtidindi, September 1964. Exports of herring on ice, frozen herring, salted herring, herring oil, and ocean perch meal showed a considerable decrease in the first 8 months of 1964.



India

FISHERIES TRENDS AND EXPORTS, FISCAL YEAR 1963/64 AND JANUARY-MAY 1964:

India's fishery landings in fiscal year 1963/64 (April-March) totaled one million metric tons or about the same as in the past three years. The outlook in the Indian fisheries seems to be a potential for greater exports which in recent years have increased in value.

The all-India Seminar met in Ernakulam (Kerala) in September 1964 and developed a plan for improving the export of

India (Contd.):

Indian fishery products from now until the end of the Fourth Five Year Plan in 1970/71. It was forecast that during that period the value of exports might be increased from the 1963 level of almost \$12.0 million to \$42.0 million.

In fiscal year 1963/64 India exported 18,398 tons of fishery products valued at almost US\$12.0 million compared with 10,859 tons valued at about \$8.5 million the previous fiscal year. The United States took about 42 percent of India's fishery products exports in 1963/64 valued at about \$5 million. Fishery products exports from that country to the United States were almost exclusively confined to frozen and canned shrimp and frozen spiny lobster tails.

Of the 16.2 million pounds of frozen and dried shrimp valued at \$6.6 million exported by India in fiscal year 1963/64, the United States took 8.2 million pounds (value \$3.9 million); total canned shrimp exports during that period were 2.4 million pounds valued at \$1.4 million, of which nearly 2 million pounds (value \$1 million) were shipped to the United States.

From 1952 to 1961, the United States aided fisheries development in the State of Kerala by contributing about \$1 million. Most of those funds went to help that State's fishing industry by building 2 ice plants, providing 4 refrigerated trucks, and assisting in a technical and fishery training program. In 1963, a Cooley loan (funds derived from sales of surplus United States agricultural commodities) was made to an Indian fishing company in Cochin which at that time became affiliated with a United States firm. Reports are that funds from that loan had not yet been used as of November 1964.

A survey of the shrimp, tuna, sardine, and mackerel resources of that area in India was made in 1963 by a United States tuna packing firm and sponsored by the U. S. Agency for International Development (AID). The United States firm's team of experts conducting the survey indicated that 6 or 7 fishery facilities would be required to exploit the available fishery resources. The project as proposed by the United States firm will produce fish meal and oil, as well as other fishery products, in a location in the Vizakapatnam and Cochin areas.

United States aid to India in supplying inboard engines, fishing gear, machinery and equipment for ice plants, cold-storage equipment, and pilot fish meal plants has made significant contributions to the development of marine fisheries in Maharashtra and Gujarat. The AID program also supplied a nylon twine and net-making factory near Bombay which started operating during the year. (United States Consulate, Madras, November 13, 1964.)

India's exports of marine exports during January-May 1964 amounted to 7,349 metric tons valued at 25.3 million rupees (US\$5.3 million), an increase of 17 percent in quantity and 6 percent in value from the same period in 1963. Besides dried fish, principal export items were: frozen shrimp, 5.2 million pounds valued at \$2.4 million; dried shrimp, 2.9 million pounds (\$0.9 million); frog legs, 265,000 pounds (\$139,000). Frozen shrimp exports were up 34 percent in quantity and 21 percent in value from the same 5-month period in 1963. (*Indian Seafoods*, Vol. II, No. 1, June 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 53; January 1964 p. 52.



Ireland

FISHING LIMITS EXTENDED TO 12 MILES:

Irish fishing limits were extended to 12 miles by the Maritime Jurisdiction (Amendment) Bill passed by the Irish Dail (Parliament)

on November 5, 1964. The bill made it possible for the Government of Ireland to ratify and implement the "6-plus-6" fisheries convention approved by 13 nations in March 1964 at the European Fisheries Conference in London.

The Irish Minister of External Affairs announced that Ireland planned to designate Belgium, France, Germany, the Netherlands, Spain, and the United Kingdom as countries whose fishermen would have a right to fish in the 3- to 6-mile Irish coastal zone until December 1966. In applying the 3- to 6-mile limits to those fishermen, the base line will be the low-water mark until December 1965. After that time, straight base lines will be used.

The main effect of the new Irish fishing limits will be to exclude Eastern European and Scandinavian fishermen from Irish coastal waters. On the same day that the Maritime Jurisdiction (Amendment) Bill was considered and passed, the Irish Minister for Defense in reply to a parliamentary question noted that while the Irish Navy has 3 armed ships (corvettes), as a result of a shortage of key personnel only 1 of them can be operated at a time. The Minister of Defense said no decision had been made to purchase additional armed vessels for fishery protection. (United States Embassy, Dublin, November 13, 1964.)

Note: See *Commercial Fisheries Review*, May 1964 p. 40.

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FISHERIES REPORT RELEASED ON SURVEY MADE BY U. S. STUDY GROUP:

A report on the potential of the sea fisheries of Ireland, prepared by a team of United States fisheries specialists, was recently made public by the Government of Ireland, Dublin, announced the U. S. Department of the Interior on October 31, 1964.

The report was prepared this past summer by the four-man team from Interior's Bureau of Commercial Fisheries, and is the result of a cooperative study made at the request of the Government of Ireland.

The report includes recommendations that: (1) a stable Irish fishery policy is needed to encourage private investment; (2) the supply of fish and shellfish should be increased and stabilized; (3) the processing segment of Irish fisheries should be developed (the small population of Ireland limits the domestic market,

Ireland (Contd.):

so major expansion would come from export of processed fishery products); and (4) Ireland's marketing structure should be streamlined to handle increased production.

At a news conference in Dublin, Ireland's Parliamentary Secretary to the Minister of Lands thanked the United States for its cooperation and said he "looks forward to useful cooperation in the future with American authorities in relation to fisheries problems of mutual interest."

The United States fisheries specialists made the study in cooperation with the Irish Sea Fisheries Board and the Fisheries Bureau of Ireland's Department of Lands. The survey resulted from a meeting in October 1963 between Irish Prime Minister Lemass and the late President Kennedy.

The United States study group was headed by John B. Glude, a marine biologist. Other members of the team were Joseph W. Slavin, a technology specialist, Robert Lavell, an economist, and Keith A. Smith, a specialist in exploratory fishing.

Note: See Commercial Fisheries Review, Sept. 1964 p. 69.



Jamaica

FISHERY INDUSTRY EXPANSION PLANNED:

A £3.5 million (US\$9.8 million) plan to develop Jamaica's fishing industry is being considered by the Jamaica Government, announced the Minister of Development and Welfare. The Minister states that the plan would provide employment for about 1,000 persons, contain provisions for exporting surplus fresh fish and shrimp, and include fish-canning operations.

The local press in Kingston also reported that the Minister referred to the possibility of a tuna-canning plant. There have been rumors over the past several years that the Government has been interested in attracting a tuna-canning plant to Jamaica. As of the end of October 1964, no final decisions had been made by the Government on the proposed fishery plan.

The Minister also announced a \$2.5 million Fisheries Development Project to be financed



by the United Nations Special Fund and Caribbean governments. (United States Embassy, Kingston, October 29, 1964.)



Japan

FROZEN TUNA EXPORT MARKET TRENDS:

The price of Japanese whole frozen albacore tuna exported to the United States from Japan proper early in November 1964 declined to US\$355 a short ton c.i.f. or \$5 a ton less than gilled-and-gutted frozen yellowfin. The decline in the albacore price, even below that for yellowfin, was attributed to the large quantity of albacore landed by Japan's tuna longliners operating in the Atlantic Ocean. Almost all that albacore was transshipped to United States canneries at Puerto Rico. In addition, there have been substantial quantities of albacore transshipped to the United States from the Indian Ocean.

In mid-November about 500 short tons of frozen albacore were to be shipped to Puerto Rico from the newly designated transshipment port of Durban, South Africa. In late November, 1,500 tons of frozen albacore were to be shipped to Puerto Rico from Port Louis, Mauritius Island, which was also recently designated as a transshipment port. The Port Louis shipment was to be transported on a Norwegian vessel.

Catch of yellowfin tuna continued poor in the Atlantic Ocean as of early November. As a result, exports of Japanese-caught yellowfin tuna (gilled and gutted) to Italy were bringing the unusually high price of \$420-425 a metric ton c. & f. (Suisan Tsushin, November 5; Suisan Nippo, November 7, 1964.)

Japan (Contd.):

EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO U. S.,
JANUARY-SEPTEMBER 1963-64:

Japan's export validations of frozen tuna and frozen tuna loins to the United States in September 1964 totaled 13,274 short tons. Of that total, 48.8 percent were for albacore tuna, 45.8 percent for yellowfin, 0.2 percent big-eyed, 0.8 percent skipjack, and 4.4 percent tuna loins.

TUNA PURSE-SEINE FLEET
ARRIVES IN AFRICA:

The Japanese fishing company's five-boat tuna purse-seining fleet, led by the refrigerated mothership Chichibu Maru (1,600 gross tons), arrived at Freetown, Sierra Leone, on November 5, 1964. The fleet, which was to be joined by seven pole-and-line tuna vessels, was scheduled to start fishing immediately.

Japan's Export Validations for Frozen Tuna and Tuna Loins to U.S.,
January-September 1964 with Comparisons

Species	Sept. 1964			Jan.-Sept. 1964			Jan.-Sept. 1963			
	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Total 1963
	(Short Tons)									
Albacore, round	4,023	2,455	6,478	21,059	26,148	47,207	7,395	20,430	27,825	36,737
Yellowfin:										
Round	-	147	147	-	1,088	1,088	-	501	501	-
Gilled & gutted:										
20/100 lbs.	3,846	911	4,757	22,566	3,259	25,825	14,344	3,851	18,195	-
100 lbs. up	462	-	462	2,236	-	2,836	880	-	880	-
Drstd. with tail	50	664	714	75	3,971	4,046	-	3,684	3,684	-
Fillets	-	-	-	33	12	45	262	104	366	-
Total	4,358	1,722	6,080	24,910	8,330	33,840	15,486	8,140	23,626	33,370
Big-eyed:										
Gilled & gutted	-	-	-	30	30	60	20	4	24	-
Drstd. with tail	-	27	27	-	197	197	-	240	240	-
Fillets	-	-	-	37	3	40	6	42	48	-
Total	-	27	27	67	230	297	26	286	312	316
Bluefin fillets	-	-	-	-	1	1	-	374	374	374
Skipjack, round	-	103	103	8	2,969	2,977	70	2,312	2,382	3,762
Loins:										
Albacore	239	-	239	2,436	-	2,436	1,586	-	1,586	-
Yellowfin	347	-	347	2,871	-	2,871	2,048	-	2,048	-
Bluefin	-	-	-	-	-	-	157	-	157	-
Total	586	-	586	5,307	-	5,307	3,791	-	3,791	6,183
Grand Total	8,967	4,307	13,274	51,351	37,678	89,629	26,768	31,542	58,310	80,742

Source: Japan Frozen Food Exporters Association.

During January-September 1964, Japan's export approvals amounted to 89,629 short tons, an increase of 31,319 short tons or 54 percent more than the 58,310 short tons exported during the same period in 1963. On a species basis albacore exports were up 70 percent, yellowfin 43 percent, skipjack 25 percent, and tuna loins 40 percent. Exports of big-eyed tuna were down 5 percent.

Frozen tuna approved for export during January-September 1964 exceeds the total amount exported during all of 1963 by 8,887 short tons. (Fisheries Attache, United States Embassy, Tokyo, October 15, 1964.)

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The catches are to be sold to a large United States canning firm. (Shin Suisan Shimbun Sokuho, November 7, 1964.)

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PURSE-SEINING GEAR
IMPROVEMENTS ADOPTED:

Purse-seine fishing off the Sanriku district (northeastern Japan) is drawing attention in Japan as one of the bright spots in the Japanese fishing industry as a result of the introduction of the power block and other improvements in fishing gear and techniques.

Japan (Contd.):

Purse-seining is conducted by one-boat seiners of up to 250 gross tons, which fish mainly for skipjack tuna; and by two-boat seiners, which fish primarily for bluefin tuna. Two-boat seining involves a total of 5-7 fishing vessels. They include two seiners of less than 80 gross tons each, skiffs, and transport vessels.

In 1962 one of Japan's large fishing companies introduced the power block, which was installed on the *Keiyo Maru* (240 gross tons). Two years of experiments with the power block, using a modified version of the United States purse-seine net, have sufficiently demonstrated the value of that mechanical device in reducing manpower requirements from about 27 to 18. An increasing number of two-boat purse-seine operators are reported to be contemplating converting to the one-boat type operation.

More recently, a mechanical net hauler was developed in Japan. Called the "side hauler," this gear, developed and patented by a Japanese fishing company of Ishinomaki, consists of a number of rubber "balls" mounted at two-meter intervals on a hydraulically-operated rotating shaft located on the side of the vessel. During net hauling, the "balls" on the rotating shaft cause the net to fold between them, thus facilitating hauling. One Japanese fishing company has adopted the side hauler for use on the two purse-seiners (140 gross tons each) assigned to the *Chichibu Maru No. 2* (1,639 gross tons) mothership fleet, which was scheduled to commence skipjack fishing in the Atlantic Ocean off West Africa in mid-November 1964.

Advantages of the side hauler are: (1) manpower requirement for net hauling is reduced by one-third (in a two-boat operation from 70-80 men down to about 50); (2) net hauling time is reduced one-half; (3) net setting can be done ten times faster, and completely without human labor, because of its reversible feature; (4) damage to net during setting and hauling is greatly reduced; and (5) operation and repair are simple.

Other new equipment being adopted by Japanese purse-seiners includes the side thruster and the bow thruster. The thrusters prevent vessel drift during fishing operations and perform the task heretofore undertaken by skiffs.

The discovery of fish schools is the key to successful purse-seine fishing. New scouting methods, such as the use of television cameras on small unmanned aircraft and underwater radar are being studied. Also under study is the problem of engine vibration on large steel vessels, which has been found to cause dispersion of fish schools. Padding of the engine bed is being experimented as a means of reducing vibration. (Hokkai Suisan, October 19; Suisan *Keizai Shimbun*, October 19; Suisan Tsushin, October 16, 1964.)

CANNED SALMON PRODUCTION AND MARKET TRENDS:

The Japanese fishing companies which purchased about 7,200 metric tons of Alaskan salmon (Prince William Sound fish) in August 1964 were expected to finish canning those fish (for export only) by the end of November. The companies had originally hoped to can 300,000 cases of pink salmon, but about one-third of the Alaskan pinks (when scheduled for canning) were not expected to meet export standards, so those fish were to be salted for sale on the Japanese domestic market. Of the revised pack target of 200,000 cases, about 40,000-50,000 cases were expected to be packed as fancy and the remainder as standard.

In addition, about 1,000 tons of chum salmon of Alaskan origin were scheduled for sale on the Japanese market. To avoid market disruption, the Fisheries Agency had ruled that only one-half or 500 tons should be placed on the market in 1964, with the remainder to be released in 1965. Frozen round chum of Alaskan origin sold through one brokerage firm brought 300 yen a kilogram (38 U.S. cents a lb.) for female fish and an average of 225 yen a kilogram (28 U.S. cents a lb.) for mixed (male and female) fish.

The Japan Canned Salmon Sales Company announced in late October the following export prices for their products:

Japanese Canned Salmon Export Prices, 1963-1964				
Type, Can and Case Size	Price/Case			
	1964		1963	
	Shilling	US\$	Shilling	US\$
Red, standard 1/ 1/2-lb. 48's	157	21.98	147/6	20.65
1/4-lb. 96's	196	27.44	192/6	26.95
Silver, standard 2/ 1/2-lb. 48's	115	16.10	103	14.42
1/4-lb. 96's	137	19.18	-	-
Pink, fancy 3/ 1/2-lb. 48's	-	11.50	-	11.50
1/4-lb. 96's	-	13.50	-	13.50
Pink, standard 4/ 1/2-lb. 48's	-	11.00	-	11.00
1/4-lb. 96's	-	13.00	-	13.00
1/C.i.f., to be shipped by February 28, 1965. However, exports to Australia to be shipped by December 31, 1964. 2/C.i.f., to be shipped by December 31, 1964. 3/F.o.b., to be shipped by December 31, 1964. 4/F.o.b., to be shipped by February 28, 1965.				

Quantity of canned salmon to be released as follows:

red salmon, standard: about 63,000 cases of 1/2-lb. 48's and 5,000 cases of 1/4-lb. 96's. The 1/4-lb. style made up of fish of Alaskan origin.

silver salmon, standard: slightly less than 5,000 cases.

pink salmon: of 450,000 cases consigned to the Sales Company, 360,000 cases sold, leaving on hand 90,000 cases. About 200,000 cases of pink of Alaskan origin expected to be canned by November's end, thereby, leaving on hand 290,000 cases.

The salmon of Alaskan origin (pink) was expected to be canned in the following styles and quantity:

1/2-lb. fancy	27,000 cases
1/2-lb. standard	110,000 "
1/4-lb. fancy	17,000 "
1/4-lb. standard	40,000 "

(Suisan Tsushin, October 30, 31, & November 2 & 9; Hokkai Suisan, November 9, 1964.)

CANNED SHRIMP EXPORTS, JANUARY-SEPTEMBER 1964:

Japan's exports of canned shrimp in January-September 1964 amounted to 372,224 cases (converted to 24 1-lb. cans). During that period Great Britain received the largest share, or 46 percent of the total exports which were 33 percent more than was received during the entire year 1963. The United States took about one-third Japan's total canned shrimp exports in the first 9 months of 1964 as compared with 59 percent during the entire year 1963.

Japan's export target for fiscal 1964 was originally set at 600,000 cases, of which 440,000 cases were to go to the United States and Canada. The export target was later reduced to 500,000 cases, with a larger quantity earmark-

Japan (Contd.):

Table 1 - Japan's Exports of Canned Shrimp by Country of Destination, January-September 1964

No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases)							
24/1-1b.	small	-	100	-	-	50	150
24/1/2-1b.	"	35,131	70,654	3,636	9,185	4,511	123,117
24/1/4-1b.	"	2,130	15,943	-	-	-	18,307
48/1/4-1b.	"	250	5	-	500	120	875
24/1/2-1b.	tiny	36,662	33,410	1,000	3,920	8,531	83,523
24/1/4-1b.	"	6,274	22,626	-	400	799	30,099
48/1/4-1b.	"	-	14,230	-	-	4	14,234
24/1/2-1b.	broken	44,866	9,300	44,692	-	2,491	101,349
24/1/4-1b.	"	2,262	40,930	-	-	241	43,433
46/1/4-1b.	"	949	2,050	-	-	25	3,024
Total std. cases 1/		123,191	169,598	49,328	13,805	16,302	372,224
Export target - 1964 2/		165,000	230,000	65,000	20,000	20,000	500,000

1/Converted to 24 1/2-lb. cans per case.

2/Total export target reduced to 500,000 cases from original estimate of 600,000 cases.

Source: Japan Canned Crab Sales Company; since May 1, 1963, has acted as sole sales agent for canned shrimp.

Table 2 - Japan's Exports of Canned Shrimp by Country of Destination, January-December 1963

No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases)							
24/1/2-1b.	-	134,859	51,678	18,364	11,018	15,587	231,506
24/1/2-1b.	small	86,399	59,110	26,750	22,055	4,620	192,934
48/1/4-1b.	"	1,933	9,000	-	4,535	1,182	16,650
24/1/2-1b.	tiny	52,825	1,350	6,050	3,650	3,795	67,670
48/1/4-1b.	"	500	200	-	235	3,682	4,617
24/1/2-1b.	broken	111,511	50	26,080	-	2,264	139,905
48/1/4-1b.	"	7,130	6,000	-	-	665	13,795
Total std. cases 1/		395,157	127,388	71,244	41,493	31,795	667,077

1/Converted to 24 1/2-lb. cans per case.

Source: Ministry of Finance and Japan Canned Crab Sales Company.

Table 3 - Japan's Exports of Canned Shrimp by Country of Destination, January-December 1960-63

Calendar Year	No. Cans per Case	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Std. Cases)							
1963	24/1/2-1b.	395,157	127,388	71,244	41,493	31,795	667,077
1962	24/1/2-1b.	199,944	104,057	84,385	8,345	21,205	417,936
1961	24/1/2-1b.	31,314	11,876	19,051	2,082	10,980	75,303
1960	24/1/2-1b.	2,366	3,478	453	551	7,576	14,424

Source: Ministry of Finance.

ed for Great Britain but with fewer shipments to the United States. (Fisheries Attache, United States Embassy, Tokyo, November 5, 1964.)

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FISH CANNERS DISCUSS PRODUCTION COSTS WITH FISHERIES AGENCY REPRESENTATIVES:

The Japanese Fisheries Agency has plans to extend its authority to the manufacture and sale of fishery products. It will also cooperate in the promotion of Japanese fishery exports. That was disclosed at a Tokyo conference attended by officials of the Fisheries Agency and representatives of the Japanese canned fish industry. The purpose of the con-

ference was concerned with promoting exports of Japanese canned fishery products.



Fig. 1 - Cutting table in a tuna cannery in Hiroshima, Japan.

Japanese tuna canners at the conference asked the Fisheries Agency to set up some control over the supply of tuna for canning. The tuna canners said Japanese exports of frozen tuna were increasing and causing scarcities and high prices on tuna used for canning.



Fig. 2 - Interior of a tuna cannery in Hiroshima. In right foreground is a vacuum seamer.

Japanese land-based salmon canners requested an extension of the fishing period in Area B (Japanese-U.S.S.R. Fisheries Treaty waters south of 45° N. latitude) in order to ease the high costs of fish due to light landings.

Canned fish industry representatives at the conference also expressed an interest in lower prices for metal cans and lower interest rates for financing. (Nihon Kogyo, October 19, 1964.)

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Japan (Contd.):

POSITION DEVELOPED FOR INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION MEETING:

The Japanese Fisheries Agency, on November 12, 1964, according to the Japanese press, held a meeting with Japanese industry advisors to develop the position Japan should take at the Annual Meeting of the International North Pacific Fisheries Commission (Canada, Japan, and United States) which convened at Tokyo from November 16, 1964. The position adopted at that meeting with respect to salmon and halibut was believed to be essentially as follows:

1. With regard to the regulation of salmon fishing in the intermingling area west of the provisional abstention line, Japan will maintain her traditional position that Japanese high-seas fishing, which is not subject to restrictions under the present Treaty, shows no evidence of adversely affecting reproduction of the Bristol Bay red salmon. However, while paying careful attention to resource conservation, Japan should stress the establishment of rational joint conservation measures to be carried out after the conclusion of a new treaty without regard to the existing provisional abstention line. Concerning other salmon species and king crab, Japan will bear in mind her relations with the Soviet Union and continue to maintain her earlier attitude.
2. As for Bering Sea halibut conservation measures for 1965, since halibut catches in 1964 were extremely poor, with indications of declining abundance, Japan will propose closing Triangle Area 3B to rehabilitate the stocks.
3. Japan will strongly press for removal of restrictions on halibut fishing in Area 1 and Area 3B South.

The Japanese position adopted at the November 12 meeting with respect to trawl operations in the Gulf of Alaska and in the waters south of the Alaska Peninsula is believed to be as follows:

1. Japan will avoid detailed discussions on the effect trawl operations have on halibut stocks in Convention waters, since bottomfish fishing is not restricted by the Treaty. Moreover, the species of fish taken in the Gulf of Alaska and in waters south of the Alaska Peninsula are bottomfish other than halibut.
2. In view of the relatively large number of foreign fishing vessels other than those of Japan, the United States, and Canada operating in those waters, as well as the very low percentage of halibut taken incidentally by the Japanese trawlers, Japan plans to increase her trawl fleet in the Gulf, although not on a substantial scale. Japan should notify the member countries of her intentions of conducting year-round fishing, including mothership-type operations, in those waters. To avoid catching halibut, Japan should exert efforts to develop improved stern-trawling techniques.
3. Japan will oppose closure of areas to trawling since Japanese trawl operations have not adversely affected the halibut stocks. Reasons for opposing such an action are: (1) trawling for bottomfish other than halibut is not restricted by the Treaty; and (2) incidental halibut catches are returned to the ocean, so there is no need to establish closed areas to assure protection of that species.
4. Concerning Article III-1 of the Convention, which provides for joint conservation measures for those species of fish listed in the Annex, Japan will recommend that further investigations be made since data presently

available shed very little information. (Suisan Tsushin, November 14, 1964.)

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INDUSTRY MEETING SCHEDULED TO DEVELOP POSITION FOR NORTHWEST PACIFIC FISHERIES COMMISSION MEETING:

The Japanese Fisheries Agency scheduled a series of meetings, beginning in early December 1964, to study the position that Japan should take at the Ninth Annual Meeting of the Northwest Pacific Fisheries Commission (Japan and U.S.S.R.) scheduled to begin in Tokyo, March 1, 1965).

According to informed sources, Japan likely will request an increase in salmon catch quotas for both Areas A and B (1964 quota for each area was 55,000 metric tons), as well as an increase in the king crab production quota. Japan's share of the 1964 king crab production quota of 630,000 cases (48 No. 2 or 6.5 oz. cans) was 252,000 cases. The Japanese industry is said to feel that the request for an increase in salmon catch quota is not unreasonable inasmuch as 1965 is a dominant year for Asian pinks. Also, the condition of the salmon resources as a whole is almost certainly to be far better than it was in 1964.

However, based on the experience of the last few sessions, these same sources believe that the negotiations will be anything but smooth. Their belief is based on the following reasoning: (1) As yet there has not been a formal exchange of notes on increasing the catch in 1965 (peak year for pinks) as there was prior to the Seventh Session; (2) unexpected poor catch of salmon in 1964; (3) report broadcasted by Radio Moscow towards the end of the 1964 fishing season that the catch quota agreed on at the Eighth Annual Meeting was much too high; (4) increased interest shown by Soviet Union towards regulating the fishery in Area B; and (5) the effect of the Japan-United States king crab negotiation and the negotiations to revise the Tripartite Fisheries Treaty or the International North Pacific Fisheries Convention--Canada, Japan, United States. (Suisan Keizai Shimbun, November 14, 1964.)

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BERING SEA BOTTOMFISH FISHERY:

The Japanese fishing companies operating bottomfish fleets in the Eastern Bering Sea have begun a study to determine fishing plans

Japan (Contd.):



Main deck of a Japanese factoryship in Bering Sea. In center a netload of fish is being unloaded from a lighter.

for 1965. Their fleets landed in 1964 a combined total of 411,130 metric tons of bottom-fish, surpassing 1963's landings by about 100,000 tons. However, from a management standpoint, the companies have not done too well due to a drop in fish prices and higher operational expenses. As a result, the firms hope to devise measures to stabilize their operations and are considering such measures as reducing the number of catcher vessels assigned to motherships and reducing the number of non-fishing motherships and replacing them with large stern trawlers. (Suisan Keizai Shimibun, October 30, 1964.)

TRAWLING OPERATIONS IN GULF OF ALASKA:

The six Japanese trawlers operating in the Gulf of Alaska waters as of October 13, 1964, caught a total of 17,000 metric tons of bottom-fish (rockfish 11,000 tons; shrimp 2,700 tons; sablefish 900 tons; flatfish 600 tons; others 1,800 tons). This was an increase of 8,000 metric tons over the 1963 landings, which totaled 9,000 metric tons.

The trawler Tenryu Maru (545 gross tons), operated jointly by two Japanese firms, was expected to terminate operations around October 20. The other 5 trawlers were scheduled to continue operations in the Gulf until the end of October. (Suisancho Nippo, October 16, 1964.)

DEVELOPMENT OF NEW FISHING GROUNDS PLANNED:

Japan's Fisheries Agency plans to start developing new fishing grounds at home and abroad starting fiscal year 1965 with the objective of increasing fish resources. The reason behind that plan is that the demand-supply relationships of fish are getting out of balance because fish production has been static during the past 2 or 3 years, while the demand centered on high- and medium-grade fish is continuing to increase. Another reason is that, if this situation continues, there is the fear that Japan, which is a fisheries nation, may become an importer of fishery products. Therefore, from the standpoint of developing large shallow-sea fishing grounds at 20 places along the coast of Japan, the Fisheries Agency plans first to conduct topographical and boring surveys at 6 of those places in fiscal year 1965, and to formulate a new fishing grounds development project. Moreover, in order to develop the undeveloped sea areas south of Africa, Australia, and South America, the Fisheries Agency plans to build a new type 2,600-ton vessel in 2 years starting in fiscal year 1965, and to send it first to sea areas around Australia.

The survey conducted by the Fisheries Agency reveals that the keynote of the demand-supply relationships of marine products has gotten out of balance during the past 2 or 3 years and that the prices of such products are also tending to rise. Fishery landings are showing a leveling-off trend. They amounted to 6,710,000 tons in 1961; 6,860,000 tons in 1962; and 6,690,000 tons in 1963. On the other hand, the focus of demand for marine products is moving from fish for popular use, such as horse-mackerel, mackerel, and mackerel-pike to high- and medium-grade fish such as bream, bass, lobster, and yellow tail. The demand level was up to 7,110,000 metric tons in 1962. Thus, demand-supply relationships are tending to be out of balance.

Moreover, under a mid-term economic plan, maximum production in 1968 is estimated at between 7,400,000 tons and 7,600,000 tons, while the demand level is estimated at 9,540,000 tons. The gap between the two figures is wide. Under the circumstances, Japan will either have to import large quantities of fishery products or locate new fishing grounds. (Translation from the Japanese periodical Nihon Kaizai, United States Embassy, Tokyo, November 5, 1964.)

FROZEN MACKEREL EXPORTS TO RUMANIA:

Several Japanese trading firms are actively engaged in exporting frozen mackerel to Rumania and other countries in eastern Europe. A Tokyo trading company reported signing a long-term contract to export monthly 750 metric tons of East China Sea mackerel to Rumania. Another trading company also signed a contract to export 720 metric tons to that country. Both transactions are said to have been concluded at export prices of around US\$286 a metric ton c.i.f. Rumania. (Minato Shimibun, October 17, 1964.)

FISHING UNION ADOPTS FIXED MINIMUM WAGE SYSTEM:

The Fishermen's Union (membership 2,529) of Muroto, Kochi Prefecture, Japan, has signed a wage contract with the Murotomisaki Boat-owners Association calling for the payment of a minimum of 22,500 yen (US\$62.50) a month

Japan (Contd.)

in fixed wages for members sailing on vessels under 200 gross tons and 23,500 yen (\$65.28) a month for those sailing on vessels over 200 gross tons. In addition, the contract calls for production incentives in the form of bonuses, calculated on the basis of vessel size, value of landing, and days out fishing. Bonuses are expected to total no less than 25,000 yen (\$69.44) a month, so the monthly income of the lowest level seaman is expected to total close to 50,000 yen (\$138.88), or about 15 percent higher than under the former catch-share system.

The new wage agreement also provides for 12 days of leave with pay, trip expenses for home visits, no work on Sundays, legal holidays and eight-hour work days while in port, and eight hours rest per day while at sea. (Suisancho Nippo, October 29, 1964.)

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CONSTRUCTION BIDS FOR FORMOSAN TUNA VESSELS AWARDED IN JAPAN:

Awards for the construction in Japan of 16 Formosan tuna vessels were formally announced in early November 1964. The Japanese shipbuilding firm awarded one contract is to build three 1,300-ton vessels, another firm awarded a contract is to build eight 300-ton vessels, and still another firm five 300-ton vessels. (Suisancho Nippo, November 9, 1964.)

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VESSEL CONSTRUCTION LOAN OBTAINED FROM GREAT BRITAIN:

A Japanese fishing firm has borrowed US\$3.0 million from a London bank to be partly applied for the payment of stern trawlers that company plans to build. Under the loan agreement, the loan will be payable in five years, including a two-year deferment period. Interest rate is 6 percent per annum. Reportedly, the interest rate for a similar loan secured in Japan is 9.6 percent per annum. (Nihon Suisan Shimbun, October 9, 1964.)

* * * * *

IMPORTATION OF 71,000 TONS OF FISH MEAL:

The Ministry of International Trade and Industry of Japan announced that it has authorized foreign funds for the importation of 71,000

metric tons of fish meal for the period November 1964-March 1965. Of the 71,000 tons, 50,000-60,000 tons had been contracted for delivery at US\$131-132 a metric ton c.i.f. The contracts were negotiated before the increase in price of Chilean and Peruvian fish meal. The current prevailing price of Chilean and Peruvian fish meal is estimated at US\$151-153 a metric ton c.i.f. Japan.

Japanese imports of foreign meal after April 1965 are expected to total 13,000-15,000 metric tons a month. (Suisan Tsushin, November 6, 1964.)

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PRODUCTION TARGET OF 1964/65 ANTARCTIC WHALING EXPEDITION:

Three Japanese fishing companies will operate 7 factoryships in Antarctic waters during the 1964/65 international Antarctic whaling season. This is the same number of vessels as operated during the 1963/64 season. With the exception of the factoryship Nisshin-Maru No. 2, which was scheduled to sail from Japan on November 7, 1964, the other 6 vessels had departed for the whaling grounds at an earlier date.



Whale catcher boat alongside whaling factoryship to receive supplies and fuel.

The catch target for sperm whales is set at 1,870 head, a decrease of 1,030 head, or 35.5 percent below the target of 2,900 head set for the 1963/64 season. The cutback in catch for the current season is attributed to the large quantity of unsold stocks of sperm whale oil (11,400 metric tons) produced by the Antarctic and North Pacific whaling expeditions during the previous season.

Japan (Contd.):

Baleen Whale Production Target of Japan's 1964/65 Antarctic Whaling Expedition		
Product	Total	
	1964/65 Season	1963/64 Season
	..... (Metric Tons)	
Oil	85,494	95,376
Frozen meat	143,136	144,418
Salted meat	6,280	6,235
Meal, bone powder, etc	5,511	5,054
Total	240,421	251,083
Yield per head	57.79	54.60
Blue-whale units	4,160	4,600

The production target of Japan's 1964/65 Antarctic expedition for baleen whale oil, meat, meal and bone powder is shown in table.

(Fisheries Attache, United States Embassy, Tokyo, October 28, 1964.)

Note: See Commercial Fisheries Review, January 1964 p. 59.

日本

Libya

GREEK VESSELS LICENSED TO OPERATE IN LIBYAN WATERS:

The Government of Libya allowed Greek trawlers and sponge vessels to operate in certain Libyan territorial waters in 1964 after paying the following license fees: trawler £L500 (US\$1,400); sponge fishing vessel £L250 (\$700); and simple fishing vessel £L100 (\$280).



Libya (Contd.):

Each Greek trawler obtaining a license to fish in Libyan waters was required to take three Libyan nationals on board for fisheries training. (Alieia, April 1964.)

Note: Libyan pound 1.00 equals US\$2.80.



New Zealand

FOREIGN TRADE IN FISHERY PRODUCTS, 1964:

New Zealand's total exports of fishery products for the fiscal year ended June 1964 were valued at US\$4.3 million. Those exports included 2.8 million pounds of spiny lobster tails valued at slightly more than \$3 million--the biggest money earner in New Zealand fishery exports.

Among other export items during the period were 5.5 million pounds of fresh and frozen fish valued at \$1.2 million, and 16,571 imperial gallons of fish oil valued at about \$166,000.

New Zealand's imports of fishery products consisted almost exclusively of canned fish. For the year ended June 1964, a total of 6.3 million pounds of canned fish valued at \$2.6 million was imported. (New Zealand Commercial Fishing, September 1964.)

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DYE-LESS COLORING TREATMENT FOR DARK-MEAT FISH DEVELOPED:

A method of coloring dark-meat fish without the use of dyes has been developed at Massey University, New Zealand. The technique was developed for New Zealand "kahawai," but it might also be applied to mackerel and other dark-meat fish.

The New Zealand Health Department, which had previously disallowed the coloring of canned kahawai for the New Zealand market, is understood to be favorably disposed to the new method.

The new coloring technique involves injecting or soaking fish with some of the same ingredients as are used in the curing of meat. The effect of such treatment on dark-meat fish is to induce a pink tint into the fish after cooking instead of the usual unattractive brownish color.

As the use of the coloring agent has been adopted by meat processors for many years, it is not expected to raise any objections from health authorities.

There is reported to be a marked consumer resistance to kahawai as a table fish because of the unappetizing appearance when cooked, even though it has a high food value and a good flavor. The approval of the new coloring technique by the New Zealand Minister of Health will remove one marketing obstacle.

It is thought, however, that to overcome traditional objections to kahawai it may be necessary to change its name to give it a different image. "Native salmon" is one of the new names suggested. (New Zealand Commercial Fishing, September 1964.)



Nicaragua

NEW EXPORT TAX ON FISHERY PRODUCTS:

Nicaraguan Decree No. 973, establishing an export tax on fishery products, was published in La Gaceta No. 197, August 28, 1964. The export tax replaces the profits tax levied under Article 28 in the Special Law on Exploitation of Fish of 1961.

Under the new law, the export tax rates per pound are as follows: fresh unprocessed shrimp C0.36 (5.14 U.S. cents); frozen shrimp C0.21 (3.0 U.S. cents); dried or dehydrated shrimp C0.07 (1.0 U.S. cent); fresh unprocessed lobster tails C0.35 (5.0 U.S. cents); frozen lobster tails C0.175 (2.5 U.S. cents); fresh whole lobsters C0.21 (3.0 U.S. cents); frozen whole lobsters C0.105 (1.5 U.S. cents); chilled whole fish C0.07 (1.0 U.S. cent); frozen whole fish C0.021 (0.3 U.S. cents); chilled fish fillets C0.14 (2.0 U.S. cents); frozen fish fillets C0.07 (1.0 U.S. cents); processed turtles C7.00 (US\$1.00); live turtles C21.00 (US\$3.00).

The indicated export tax must be paid before fishery products are exported from Nicaragua. (United States Embassy, Managua, October 29, 1964.)

Note: Nicaraguan cordobas 7.00 equal US\$1.00.



Norway

GOVERNMENT ASKS FOR INDUSTRY VIEWS ON EUROPEAN "6-PLUS-6" FISHING LIMIT CONVENTION:

All organizations within the Norwegian fishing industry have received a questionnaire from the Norwegian Ministry of Fisheries asking for their views on the "6-plus-6" fishing limit convention signed by 13 of the 16 countries attending the European Fisheries Convention in London in January 1964. Norway, Iceland, and Switzerland did not sign the Convention. (News of Norway, November 19, 1964.)



Peru

FISH MEAL INDUSTRY TRENDS, SEPTEMBER 1964:

Peruvian fish meal production in September 1964 totaled 49,000 metric tons, about the same as in September 1963. Peruvian fish meal production in January-September 1964 totaled 1,059,000 tons, up 28 percent from Peruvian production in January-September 1963.

Peruvian exports of fish meal in September 1964 were 82,000 tons bringing shipments for January-September 1964 to 1,098,000 tons, almost 25 percent ahead of the same period in 1963.

Spot prices for Peruvian fish meal eased somewhat in October 1964 as anchoveta fishing showed an expected seasonal improvement. In late October 1964, prices for November 1964 deliveries of Peruvian meal were quoted at US\$135 per metric ton f.o.b. Peru; quotations for December 1964 shipments were down to around \$126. In early October 1964, spot shipments were being quoted as high as \$145-150. (United States Embassy, Lima, November 4, 1964.)

Editor's Note: Some reports indicate that in excess of 500,000 tons of fish meal have been sold forward for the first half of 1965 at \$100-108 a ton by the Consorcio Pesquero del Peru S. A.

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FISHERY CATCH IN 1963 TOPS THAT OF ALL OTHER NATIONS:

Peru caught more fish than any other nation in 1963, reported the Food and Agricul-



Fig. 1 - Peruvian fishing vessel with hold and decks loaded with anchovetas getting ready to unload.

ture Organization (FAO), October 30, 1964. Fishery landings by that country totaled 6,901,300 metric tons in 1963, as compared with Japan's catch of 6,697,800 tons. Japan had been the world's leading fishing nation since FAO began collecting world fishery catch statistics in 1947.



Fig. 2 - Portion of Mancora tuna fleet.



Fig. 3 - Unloading tuna at Chimbote, Peru.

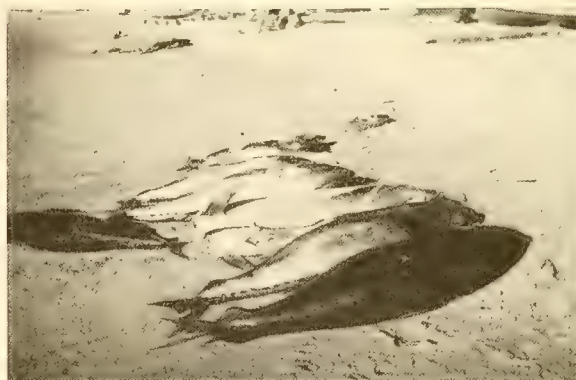


Fig. 4 - Tuna caught by small Peruvian boats are landed on the beach, awaiting to be picked up by truck for trip to freezer.

The bulk of the Peruvian 1963 catch was made up of anchoveta, a small fish found in great schools a few miles off the Peruvian

Peru (Contd.):

coast. The anchoveta is used for reduction in fish meal and oil for animal feeding, and is the principal factor in Peru's position as the world's leading exporter of fish meal. Peru's fishery catch now is close to 150 times larger than the 47,700-ton catch in 1948. (Food and Agriculture Organization, Rome, October 30, 1964.)



Philippine Republic

PURSE-SEINE FISHERY
BEING DEVELOPED:

Since early 1963, a Norwegian master fisherman has been showing Philippine fishermen how to fish with purse-seine nets. The Nor-



Fig. 1 - Philippine purse-seine vessel scouting for mackerel in the Sulu Sea off Palawan Island in the western Philippines. The vessel is equipped with an echo-sounder.



Fig. 2 - Philippine purse-seine vessel ready to begin night-light fishing in Sulu Sea. Note metal lamps set over the side to attract fish. Often it is midnight before enough fish are attracted to justify setting the purse-seine net.

wegian expert was sent by the Food and Agriculture Organization to help the Philippine Fisheries Commission develop a purse-seine fishery. Striking success has been reported in the project. The Philippine private company which did pioneering work in the new fishery now has five purse-seine vessels in almost year-round operation. It also operates 11 carrier vessels which carry the purse-seine catch to metropolitan markets.



Fig. 3 - Philippine fishermen brailing mackerel from purse-seine net. As the fish are hauled in, ice is thrown over from the carrier vessel alongside. The fish and ice are then shoveled into tubs which are hoisted to the carrier vessel to be transported to market.

Other Philippine private companies are entering the purse-seine fishery. By the end of 1964, a total of 30 Philippine purse-seine vessels were expected to be in operation. The new purse-seine fishery is one phase of the Philippine project to achieve self-sufficiency in fish. (Food and Agriculture Organization, Rome, October 28, 1964.)

Note: See Commercial Fisheries Review, February 1963 p. 85.^o



Portugal

CANNED FISH EXPORTS,
JANUARY-JUNE 1964:

Portugal's total exports of canned fish in oil or sauce during the first half of 1964 were at about the same quantity level as in the comparable period of 1963. Sardines accounted for 79 percent of the total canned fish exports in the first half of 1964.

Portugal's principal canned fish buyers during the first half of 1964 were Germany with 5,384 metric tons, the United Kingdom with 3,955 tons, France 3,242 tons, the United States 2,737 tons, Italy 2,461 tons, and Belgium-Luxembourg 2,205 tons. Germany's purchases of canned fish from Portugal

Portugal (Contd.):

Portuguese Canned Fish Exports, January-June 1963-64				
Product	January-June			
	1964		1965	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In oil or sauce:				
Sardines	23,754	1,250	23,103	1,216
Chinchards	1,693	89	570	30
Mackerel	1,709	68	2,170	86
Tuna and tuna-like	610	20	1,003	33
Anchovy fillets	1,743	174	2,338	233
Others	405	21	162	8
Total	29,914	1,622	29,346	1,606

in January-June 1964 increased 13 percent from those in the same period of 1963. Purchases by the United Kingdom were up 10 percent, and those by France were up 25 percent. But purchases by the United States and Italy in the first half of 1964 were down 19 and 36 percent, respectively. (Conservas de Peixe, August 1964.)

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PRIORITY FISHERY PROJECTS UNDER NEW THREE-YEAR ECONOMIC DEVELOPMENT PLAN (1965-1967):

Preliminary proposals under the new Portuguese Three-Year Economic Development Plan for 1965-1967 were announced by the Portuguese Minister of State on October 6, 1964, although the Plan must be reviewed further. The Plan includes Government and private investment projects considered most important by the Portuguese Government. Included are priority fishery investments in Continental Portugal totaling over US\$11 million and priority fishery investments in Portuguese Overseas Territories totaling over \$35 million.

In Continental Portugal, the priority fishery investments are mostly for the construction of new fishing vessels. The high rate of obsolescence in the Portuguese fishing fleet is of concern to the Portuguese Government, according to previous reports. Since 1959, the Portuguese Treasury has lent over \$14 million to the Fund for the Renovation and Equipping of the Fishing Industry.

Table 1 - Value of Portuguese Planned Priority Fishery Investments in Continental Portugal^{1/} During 1965-1967^{2/}

Sector and Project	Value	
	1,000 Escudos	US\$1,000
Cod Fishery:		
Construction of 3 trawlers of 2,800 gross tons each	102,000	3,570
Replacement and improvement of equipment on existing cod-fishing vessels	16,670	583
Total cod fishery	118,670	4,153
Trawl Fishery:		
Construction of 1 freezer-transport vessel of 3,000 gross tons	35,000	1,225
Construction of 4 steel coastal trawlers of 150 gross tons each	24,800	868
Construction of 2 wooden lobster trawlers of 300 gross tons each	20,000	700
Construction of 2 freezer trawlers (for shellfish) of 130 gross tons each	8,670	303
Construction of 5 offshore trawlers to work with freezer vessels	24,000	840
Total trawl fishery	112,470	3,936
Sardine Fishery:		
Replacement of old seine vessels by new vessels of 50 gross tons each; and reconstruction and improvement of existing equipment	5,340	187
Tuna Fishery:		
Construction of 4 offshore tuna vessels, each having a 100-ton fish-hold capacity	28,000	980
Local Fishery:		
Motorization, improvement of equipment, and repair of vessels	7,000	245
Oyster Industry:		
Nurseries and purification plants	800	28
Marketing:		
Freezing plants and sales stores at:		
Matosinhos	12,670	443
Figueira da Foz	1,470	52
Lisbon	8,000	280
Funchal (Madeira)	4,000	140
Horta (Azores)	5,340	187
Total marketing	31,480	1,102
Support for Distant Fishing:		
Equipment for freezing and storing fish	14,400	505
Total planned priority fishery investments in Continental Portugal	318,160	11,136

^{1/}Includes Madeira and the Azores.

^{2/}Preliminary.

Note: Escudos 28.58 equal US\$1.00.

Portugal (Contd.):

Table 2 - Value of Portuguese Planned Priority Investments in Overseas Territories During 1965/1967^{1/}

Territory	Research and Technical Assistance		Fishing Fleet		Land Facilities and Local Marketing		Total	
	1,000 Escudos	US\$1,000	1,000 Escudos	US\$1,000	1,000 Escudos	US\$1,000	1,000 Escudos	US\$1,000
Cape Verde	7,500	262	211,500	7,403	39,000	1,365	258,000	9,030
Angola	30,000	1,050	150,000	5,250	190,000	6,650	370,000	12,950
Mozambique	18,000	630	220,000	7,700	90,000	3,150	328,000	11,480
Guinea	4,500	158	6,000	210	7,500	262	18,000	630
S. Tome-Principe .	4,000	140	2,500	87	13,500	473	20,000	700
Timor	6,000	210	2,000	70	2,000	70	10,000	350
Total overseas territories . .	70,000	2,450	592,000	20,720	342,000	11,970	1,004,000	35,140

^{1/}Preliminary.

Most of the proposed priority fishery investments in overseas territories are in Angola (\$13.0 million), Mozambique (\$11.5 million), and Cape Verde (\$9 million). The proposed overseas fishery investments include substantial outlays for land facilities and local marketing as well as for fishing vessels. For research and technical assistance, the Plan proposes investment of over \$1 million for Angola, \$630,000 for Mozambique, and smaller amounts for other Territories. (United States Embassy, Lisbon, November 11, 1964.)

Note: See Commercial Fisheries Review, June 1964 p. 57.



Senegal

SENEGALESE TUNA INDUSTRY WILL RECEIVE AID FROM THE SOVIET UNION:

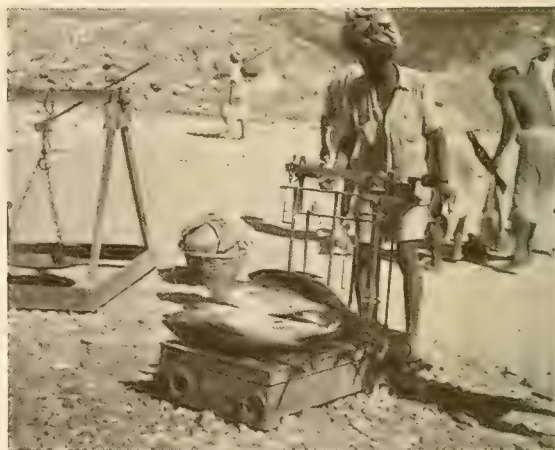
During the visit of Senegal's Foreign Minister to Moscow (October 25 to November 1, 1964), an agreement was signed between the 2 countries under which the U.S.S.R. will extend credits to Senegal amounting to about US\$6.7 million. The loan, bearing a 2.5 percent annual interest charge, will be repaid in Senegalese exports to the U.S.S.R. over 12 years. With the Soviet credits and technical aid, Senegal will construct a tuna cannery. The U.S.S.R. will also deliver to Senegal 10 tuna vessels, provide a team of technicians to operate the tuna cannery for the first 2 years, and sponsor a training program for Senegalese technicians in the Soviet Union.



Somali Republic

AID APPROVES LOAN FOR FISHERIES VENTURE:

The U. S. Agency for International Development (AID) has approved a \$543,000 loan to the Somali American Fishing Co., a joint organization of a Massachusetts firm and a Somali group. The loan will help finance a new fisheries plant near Alula on the northern tip of the Somali Republic bordering the Indian Ocean and the Gulf of Aden. The new plant will process and freeze fisheries products, mainly for export.



A local Somali fisherman weighing fish.

The loan will be made and repaid in United States dollars. Interest on the loan will be payable semiannually until June 30, 1967, and annually thereafter. Principal will be repayable in installments over a period of about 10 years beginning in 1967. (AID United States Embassy, Mogadiscio, October 22, 1964.)



South Africa Republic

FIVE TUNA VESSELS ORDERED BY FISHING FIRM:

A contract for the construction of five 300-ton all-steel refrigerated tuna fishing vessels, valued at US\$1.4 million, was awarded in August 1964 to a shipbuilding firm in Durban, South Africa, by a Cape Town fishing company. The contract is the largest that has been signed for the construction of vessels in South Africa. The first of the 5 vessels will be ready for delivery 8 months after placement of the order. The remainder of the vessels will be delivered--one every two months until the order is completed.

The vessels will be 110 feet long overall, with a beam of 22 feet, loaded draft of 9 feet, and with Diesel-powered engines capable of a speed of 12 knots. They will be fitted with 4 freezing tunnels of 10-ton capacity cooled to a temperature of -35° F. After freezing, the fish will pass to the main hold which will have a capacity of 88 tons with a temperature of -25° F. Each vessel will be fitted with fish-finding equipment, radiotelephone, and direction finders. Crew accommodations are provided for 18 persons.

Among the shipbuilding countries bidding for the contract were Holland, Spain, Denmark, and East and West Germany. It was reported that the strongest competition came from East German shipbuilders.

A spokesman for the Cape Town fishing company said the vessels will use the Japanese long-lining method for fishing tuna--laying 35 miles of long lines (carrying 2,000 hooks) to be hauled in every 24 hours. He added that the fishing waters around South Africa have a great potential and that this was only the beginning as far as tuna fishing was concerned. Plans were that the 5 new vessels would probably operate off Durban during the Cape off-season (March-October).

The company spokesman said his firm already had 3 refrigerated vessels and that a fourth was to be equipped with refrigeration facilities. In addition, the Cape Town fishing company recently purchased a 1,500-ton former Spanish motor vessel for transporting frozen shark and tuna from Cape Town to overseas markets. The company will export frozen tuna and shark. (*The South African Shipping News and Fishing Industry Review*, September 1964.)

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NEW VESSELS WILL HELP DIVERSIFY FISHERIES:

To diversify its fishing activities, a South African fisheries group ordered a series of stern trawlers, long-liners, and purse-seiners from shipyards in the Netherlands. The first deliveries arrived late in the summer of 1964 and included the 150-foot stern-trawler Pionier I; the 83-foot tuna vessels Verkenner I and Verkenner II (designed to use long lines or purse seines); and the 86-foot shoal fishing vessel Treffer I (designed mainly to use purse seines in the pilchard fishery, but also equipped to operate as a stern trawler). Delivery of the stern trawler Pionier II to South Africa was expected late in 1964.

Stern Trawlers: The stern trawlers in the Pionier series will supply a filleting and freezing plant near Cape Town which will produce frozen fillets or fish stick blocks for ex-

port. The plant is equipped with filleting machines and plate freezers. To keep that automated plant supplied with fish, the owners have invested in vessels of the most modern design. The Pionier I is capable of operating in almost any weather. Like the larger foreign trawlers working off the Cape, the Pionier I has the power, the net, and the winch to trawl down to 400 fathoms (2,400 feet). To assist in the handling of the trawl net (designed and made in west Germany from synthetic fiber), the vessel is equipped with a hydraulically-operated movable gantry.

When the net is brought up, the wings and cod-end are hauled over the stern ramp and on to the long afterdeck by the two inner drums of the winch. The cod-end is then lifted above a hydraulically-worked hatch cover, the bag is emptied, and the catch spills through the hatchway into bins in the lower deck. From those bins aft, the fish are carried forward on the starboard side to the hatches of the hold. That movement is done by conveyor where, working under cover, the crew head and gut the fish and send them through a special washing machine before feeding them through a funnel into the hold below.

Fish-hold capacity of the Pionier I is 14,330 cubic feet. The insulated hold is lined and partitioned with aluminum. It is cooled by two blower units of the vessel's gas refrigeration plant. Using that system, it is possible to keep the catch chilled at a constant temperature of 33° to 34° F. with only 0.4 tons of ice to a ton of fish.

The main engine of the 13-knot Pionier I is a 6-cylinder 4-stroke Diesel developing 900 b. hp. at 380 r.p.m. The engine acts on a 3-blade controllable-pitch propeller. The engine and the propeller pitch are controlled from the bridge. "More like a computer room than a trawler bridge," was the comment of one visitor when he saw the vessel's engine controls, electronic fish-finders, radar, automatic pilot, and other equipment.

Tuna Vessels: In late August 1964, the tuna vessels Verkenner I and Verkenner II arrived in Table Bay, South Africa, after completing delivery trips from the Netherlands. The vessels will be able to work from Cape Town, Walvis Bay, or any other harbor conveniently situated for tuna fishing. The Verkenners are identical vessels of 144 gross tons designed to fish well out to sea. Each is

South Africa Republic (Contd.):

equipped with a Diesel engine developing 435 b. hp. at 750 r.p.m. and acting on a fixed 3-blade propeller. The vessels cruise at 11 knots. Accommodations are provided for a crew of 10 or 11 who may have to spend 2 weeks or more at sea. In contrast to the typical South African pilchard vessel with aft deckhouse, the new tuna vessels have their large deck structure well forward, sharply raked stem, high foredeck stepped down to a large low aftersection, and prominent crow's nest near the top of a tripod mast amidships.

The total fish-hold capacity of each of the new tuna vessels is 40 tons. Each vessel has 6 fish holds situated below hatches on the aft working deck. The holds are refrigerated by an ammonia gas system.

During fishing operations, freshly-caught tuna are placed in a hold filled with sea water cooled to just above its freezing point of 29° F. There the tuna are chilled for two days. Salt is then added to the water and the temperature reduced to 22° F. After another 2 days, the brine is pumped out and the temperature of the dry hold brought down to between 10° and 15° F. The tuna can be thawed by pumping sea water back into the hold. That may be done shortly before landing.

Soon after their arrival, the Verkenners were fitted with Japanese-type line haulers which will work 200 baskets (34 miles) of long line. When tuna are brought to the stern as the long line is hauled in, they are lifted with the aid of an electric deck winch.

If tuna schools are found in sufficient concentration to permit purse-seine fishing, each of the Verkenners can be fitted with a power block on the boom. Purse-seine gear would be worked in conjunction with a multipurpose hydraulic winch which would be placed on a base already prepared on the afterdeck.

Shoal Fishing Vessels: Similar in appearance to the Verkenners, the new seiner-trawler Treffer I has been designed to fish for pilchards with a purse-seine net during the South African shoal fishery. During the off-season for pilchards, the Treffer I will be fitted with gallows and gantry and will operate as a stern trawler.

In deciding to fit the Treffer I with a purse seine rather than a lampara seine, the owners

were influenced by the success of the Brand and the Kruger with purse seines in the pilchard fishery. The Treffer I has an all-hydraulic system for handling the net. It also has a power block on the boom, and a multipurpose winch. The main engine of the vessel develops 420 b. hp. at 750 r.p.m. and acts on a controllable-pitch propeller. The vessel is equipped with an echo-sounder set to locate fish schools ahead and on either side of the vessel. It also carries a vertical echo-sounder and radar equipment. (The South African Shipping News and Fishing Industry Review, September 1964.)

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PILCHARD-MAASBANKER FISHERY, JULY 1964:

South Africa Republic: The Cape west coast pilchard-maasbanker season ended July 31, 1964, with the total catch well below that of the previous year. During 1964, fishermen were handicapped by bad weather and uncertain movements of fish schools.

The 1964 Cape west coast shoal fish catch through July 1964, when the pilchard season closed was 282,301 short tons pilchards, 22,121 tons maasbanker, 57,222 tons mackerel, and 25,709 tons anchovy. The total catch was 387,353 tons. In 1963, the catch was 441,943 tons pilchards, 12,827 tons maasbanker, and 14,634 tons mackerel, for a total of 649,404 tons. (There were no anchovy landings in January-July 1963.)



A Cape west coast pilchard and maasbanker cannery and fish reduction plant.

The shoal fish catch off the Cape west coast of South Africa Republic in July 1964 was 25,698 tons pilchards, 2,169 tons maasbanker, 1,903 tons mackerel, and 8,762 tons anchovy for a total of 38,532 tons. That compares with 64,726 tons pilchards and 35 tons maasbanker landed in July 1963.

The July 1964 catch yielded 9,184 short tons of fish meal, 426,242 imperial gallons of fish-body oil, 778,536 pounds of canned mackerel, 495,576 pounds of canned pilchards, and 228,672 pounds of canned maasbanker.

South-West Africa: At Walvis Bay in South-West Africa, the pilchard catch amounted to 499,881 tons during January-July 1964. The fishery in South-West Africa expected to continue until the 8 licensed factories had their combined catch quota of 720,000 tons.

By early September 1964, 4 of the 7 pilchard processing factories at Walvis Bay were scheduled to complete their 1964 quotas of 90,000 tons each. The three remaining factories at Walvis Bay were scheduled to finish by November.

South Africa Republic (Contd.):

No probable closing date was reported for the new factory at Luderitz. (The South African Shipping News and Fishing Industry Review, September 1964.)

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LARGE-SCALE TEST OF NEW ANCHOVY FISHERY PLANNED:

A total catch of about 21,500 short tons of anchovy was delivered between April 1-July 15, 1964, by a limited fleet of 5 or 6 vessels of the South Africa Republic. A much larger commercial test of the coastal anchovy resource is under way. About 50 vessels have been granted permission to use the special $\frac{1}{2}$ -inch-mesh knotless purse-seine nets needed in the anchovy fishery. The nets--costing about R8,000 (US\$11,200) each--had to be imported, so the large-scale test was delayed for a brief period. But 15 of the nets had arrived by the end of July 1964 and the remainder were expected to follow in a short time. Each of the 14 fish-meal factories in the South Africa Republic was allocated 3 anchovy nets. Reports indicate that each fish-meal factory in South-West Africa was assigned one anchovy net.

The anchovy fishery of the South Africa Republic is being allowed to continue without any definite closing date (the Cape west coast pilchard fishery closed July 31, 1964); and the South-West African fish-meal factories are not subject to anchovy catch limits such as are assigned for the pilchard fishery.

The anchovy catches are being processed into fish meal and oil. The anchovy taken in mid-1964 were smaller with a lower oil content than earlier in the year. That may indicate some seasonal change in the resource. (The South African Shipping News and Fishing Industry Review, August 1964.)

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ANCHOVY FISHERY, AUGUST 1964:

Summary: The new anchovy fishery of South Africa received its first large commercial test in August 1964. Bad weather, however, made it difficult to handle the special purse-seine nets used in the fishery. (The 14 fish meal factories in the South Africa Republic have each been allocated 3 anchovy nets; the 8 fish meal factories in South-West Africa have been allocated 2 anchovy nets.) South African fishermen will continue the test of the anchovy fishery, which is not subject to catch limit or definite closing date.

South Africa Republic: With the close of the Cape pilchard season at the end of July 1964, shoal fishermen got down to the hunt for anchovy. During that month, 20 to 25

vessels took on the necessary small-mesh purse-seine nets and went after anchovy from Lambert's Bay to east of Gansbaai. They were hampered, however, by bad winter weather, and also had trouble finding shoals in sufficient concentration. The estimated catch in August was around 4,000 short tons.

By the first week in September 1964, more than 40 Cape vessels were reported to be engaged in anchovy fishing.

South-West Africa: Early anchovy fishing operations off Walvis Bay have not been very successful. This has been due mainly to bad weather and turbulent seas which have made it difficult for vessel and crew to handle the heavy gear used in the fishery.

The first anchovy net arrived in Walvis Bay during the first week of August 1964. The net was transferred to the shoal fishing vessel Marie Christine. On her first trip the vessel was able to catch only about 4 tons of very small anchovy. The fish were about 2 inches long and were very lean. They went "soft" within a few hours. As the weather improved, catches of up to 12 tons were made later in the month.

A second anchovy net was scheduled to arrive at Walvis Bay during the first week of September 1964.

Each factory at Walvis Bay is allowed to use two anchovy nets. No restriction has been placed on the size, quantity, or season in which anchovy may be caught. However, all pilchards accidentally caught in the anchovy nets will be deducted from 1965's pilchard quota for the respective factory. (The South African Shipping News and Fishing Industry Review, September 1964.)

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PRODUCERS REPORT STRONG DEMAND FOR WALVIS BAY FISHERY PRODUCTS:

The South African fishing industry would not meet its fish meal obligations in 1964 if an additional quota was not granted Walvis Bay factories in South-West Africa, according to the Chairman of the South Africa Fish Meal Producers Association. (Editor's Note: Previous reports indicated that the South-West Africa Administration had denied a requested increase of 60,000 short tons in the 1964 Walvis Bay pilchard quota.)

The Chairman emphasized that the industry had not overspeculated on its production. There were, however, two factors which had upset industry planning. First, Philippine orders for a substantial quantity of canned fish were not received until the spring of 1964. As a result, the fish used for canning left the industry short about 10,000 tons of meal. Second, adverse weather off the Cape West Coast of South Africa during May, June, and July 1964 had reduced the expected catch, and caused meal production on the Cape to fall 15,000 tons below estimates.

In late summer 1964, the Chairman of the South Africa Fish Meal Producers Association commented on export markets for Walvis Bay fishery products as follows:

Fish Meal: The market has remained very good. Japan has asked South African producers for an additional 15,000 tons of fish meal this season. That was a request, however, and not a commitment.

The Chairman said, "In the light of this year's experience, we will have to be very careful in planning production and sales for 1965 in order not to land ourselves in the predicament of not being able to meet obligations and thereby harm our prestige."

Canned Fish: Demand for South African canned fish appears to be improving, especially in the United Kingdom.

South Africa Republic (Contd.):

The 1964 contract with the Philippines was the largest canned fish contract ever concluded by the South African industry. The contract called for 437,500 cases of fish to be shipped to the Philippines by the end of August 1964. A second shipment of half a million cases of canned fish to the Philippines was scheduled to be made by the end of October 1964.

Fish Oil: The entire South African production of fish oil in 1964 has been sold to the United Kingdom. (The South African Shipping News and Fishing Industry Review, September 1964.)

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PURSE-SEINE NETS MAY REVOLUTIONIZE CAPE SHOAL FISHERY:

With few exceptions, most South African Cape shoal fishermen would rather forget the 1964 pilchard season. In seven months of often unfavorable weather, uncertain movements of pilchard schools, and other difficulties, good fishing was always just around the corner. The total catch was down and individual hauls were disappointing. But the catch was not disappointing for two skippers using purse-seine nets. Their crews not only brought in more than an average share of pilchard but also dipped well into the anchovy shoals.

The great South African pilchard fishery of the Cape and Walvis Bay has been built on the lampara seine, which is shallower than most purse seines and easier to handle.

In South Africa, the lampara seine has graduated from 50-foot to 70-foot vessels, from cotton to the strongest synthetic fibers, and from laborious hand-hauling to the swift power block. In spite of those advances, the lampara net could be on its way out and could take with it the conventional deckhouse-aft vessel.

Some advantages of the purse-seine net over the lampara net were demonstrated in 1964 by the Kruger and the Brand. Each of those 67½-foot wooden vessels was adapted for purse-seine fishing by rebuilding the upper section, moving the deckhouse far forward, and placing a power block on a boom over an aft working deck.

In November and December 1963, the converted purse-seiners Kruger and Brand were among the six Cape vessels engaged in early test fishing for anchovy, and in January 1964

they joined the hunt for pilchard. By July 31, 1964, at the end of a season in which 130 vessels (equipped mainly with lampara nets) caught an average of 2,169 tons each, the Kruger had brought in 7,700 tons (60 percent pilchards and 40 percent anchovy), and the Brand had landed 6,545 tons (80 percent pilchards and 20 percent anchovy).

Those vessels are part of the fleet still fishing for anchovy. (The South African Shipping News and Fishing Industry Review, September 1964.)

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NEW TRAWLING COMPANY BACKED BY SPANISH-SOUTH AFRICAN INTERESTS:

With a modern fleet and a factory and distribution facilities able to handle an initial 20,000 to 25,000 short tons of trawl fish a year, a new R1.5 million (US\$2.1 million) fisheries company will come into operation in April 1965 on the South African Cape west coast. It will be based at Saldanha Bay.

The new trawling venture is backed by two South African companies and by a Spanish fishing concern whose distant-water trawlers have been working off the South African coast since the end of 1962.

An official of the new trawling company said it will erect a large and very modern processing factory at the shore end of what is known in Saldanha as the Government dock. There an initial fleet of six trawlers will land catches almost alongside processing facilities. A 1,000-ton cold-storage warehouse and a railway siding will also be located close to the factory. Fish handling will be reduced to a minimum by the close proximity of the dock, factory, and loading point.

The fish-processing plant of the company is being designed with emphasis on automatic handling of that portion of the catch which will be used to produce frozen fillets, fish sticks, fish blocks for processors overseas, and smoked fish. Two filleting machines will be installed in the plant.

Export sales of processed fishery products and fish meal will be made by the new company. But it will also supply chilled fish for marketing in South Africa.

Waste fish and offal from operations will be processed into fish meal. A reduction

South Africa Republic (Contd.):

plant with a capacity of 100 tons of raw fish in 24 hours has been ordered from West Germany for that work.

The Spanish-built stern trawlers which will form the fleet of the new company are 107½ feet long overall, with a gross tonnage of 218 tons. Their service speed is 12 knots. They carry a net which is handled by means of a gantry system working over a transom stern. At the forward end of the deck is a 98-horsepower electric winch, with two main drums and an auxiliary drum.

Fish hold capacity of each of the vessels is about 75 tons in 6 holds. The fish holds are insulated with a wood-cork-plastic "sandwich" layer, and are cooled by a sea water circulation system chilled to -2° C. (+28.4° F.).

It has not been decided whether the new trawling company at Saldanha Bay will acquire 6 of the stern trawlers, or whether it will take 4 stern trawlers plus 2 larger side trawlers equipped to freeze their catch at sea. The side trawlers would have an overall length of 147½ feet. Each side trawler of that type could carry 225 tons of frozen fish.

All of the vessels obtained from Spain will come fully equipped and will have a Spanish crew.

The Spanish partner in the new company at Saldanha Bay will be an active participant in the venture. But the Spanish partner will continue separate distant-water operations off South Africa using the stern and side trawlers which have become familiar callers in Table Bay Harbor. Hake caught by those vessels is shipped out in refrigerated transports for sale in Spain. (The South African News and Shipping Industry Review, August 1964.)

Note: See Commercial Fisheries Review, July 1964 p. 73.



Spain

TRAWLING OFF SOUTH AFRICA ATTRACTS MORE SPANISH VESSELS:

Following is a report from The South African Shipping News and Fishing Industry Review, August 1964, on the expansion of Spanish trawling activities off South Africa:

A leading Spanish fishing company is expanding its trawling operations off South Africa, which it began in 1962. The Spanish company is joining with South African interests on a trawling venture to be based at Saldanha Bay.

At the end of July 1964, another Spanish company was considering Cape Town, South Africa, as a base for one and possibly more trawlers.

A third Spanish company sent the 242.5-foot freezer-trawler Toula to South Africa late in the summer of 1964. The vessel's high freezing capacity--about 69 tons per day--indicates it may be intended as a mothership for other trawlers. The Toula has 8 blast-freezing tunnels, each of which can freeze about 5,800 pounds of fish in 10 hours in an air temperature of -40° F. It also has 2 plate freezers with a combined capacity of 1 ton an hour.

It has been asked how large and expensive fishing vessels working thousands of miles from their home ports can be made to pay. One answer to that question can be found in the report of an interview with a Spanish hake fisherman described as the skipper of a pair-fishing trawler operation in Northern Hemisphere waters. He said that hake was the fish people wanted and was of prime importance in the Spanish market. When sold on the Spanish market, frozen hake from South Africa probably would bring a price not far below that for fresh hake. (Editor's Note: During January-March 1964, ex-vessel prices at Vigo, Spain, averaged 38.3 U. S. cents per pound for hake and 20.0 cents per pound for small hake.)

Note: See Commercial Fisheries Review, Oct. 1964 p. 78, and Aug. 1964 p. 85.



Togo

FISHERIES TRENDS, JANUARY-OCTOBER 1964:

Togo's fishing fleet consists mainly of canoes and other small craft. Togo's domestic fisheries production is supplemented by foreign landings of frozen tuna and frozen sardines at Lome wharf. Frozen sardines are brought in almost exclusively by Soviet vessels. The foreign tuna landings are usually from Japanese or Soviet vessels. French and Spanish vessels occasionally land at Lome.

Togo (Contd.):

(A number of other foreign vessels operate off Togo, but land their catch elsewhere.) Tuna sold in Togo is usually smoked for local consumption. Sardines find ready acceptance in all but the most remote villages of Togo. Canned sardines are imported by Togo from France, but the supply still falls short of the demand. Imports of frozen fish via the Lome wharf during January 1-August 31, 1964, amounted to 3,571 metric tons.



An FAO fishery expert demonstrates gutting to fishermen because in Togo fish are usually dried without cleaning and gutting.

The Togolese Government would like to develop its own fishing industry. To that end, Togo extended its territorial waters to 12 miles during the summer of 1964. The Government of Togo plans harbor improvement work at Lome, and has accepted a West German aid project to supply Togo with two trawlers about October 1965 when the new port development has provided sufficient anchorage. To help its domestic fishermen, the Togolese Government is also considering increasing taxes on imported fish.

The Togolese Government has received about 20 requests from foreign fishing firms which would like to operate out of Lome when the harbor improvement work is completed. The requests are mainly from French and Italian nationals as well as Liberians and Ghanaians. (United States Embassy, Lome, November 20, 1964.)

Note: See *Commercial Fisheries Review*, Sept. 1964 p. 79; July 1964 p. 74; July 1963 p. 93; Jan. 1963 p. 118.



U.S.S.R.

STATUS OF FLEET OF
LARGE STERN TRAWLERS:

The Soviet Union's fleet of large stern trawlers as of September 1964 was composed of at least 170 stern factory trawlers of 5 different classes, according to reports from various sources.

Soviet Fleet of Large Stern Trawlers by Class and Tonnage as of September 1964				
Class	No. of Vessels	Gross Tons Per Vessel	Country of Construction	Date of Construction
Pushkin	24	2,470	West Germany	1956-8
Maiakovskii	86	3,170	U.S.S.R.	1958
Leskov	20	2,800	Poland	1960-64
Tropik	30	2,600	East Germany	1962-65
Kosmos	10	2,900	Poland	1963

The Maiakovskii and Kosmos class series were scheduled for continued construction throughout 1964. From 1 to 2 Maiakovskii class vessels were built each month at the Nikolaev Shipyards (on the Black Sea). Tropik class vessels, built at People's Shipyards (Volkswerft) at Stralsund (on the Baltic Sea) will continue to be built for the Soviet Union until the end of 1965, when a total of 65 vessels will have been delivered. Of that total, 22 vessels were to be delivered during 1964, and 23 will be delivered in 1965. Reports are that after 1965, East German shipyards may continue the construction of Tropiks for their own fishing fleet. (Le Marin, June 5, 1964; Nordseezeitung, various 1964 issues and other publications.)

SOVIET FISHING VESSELS OFF
NORTHEASTERN COAST OF JAPAN:

Large numbers of Soviet fishing vessels appeared off the Sanriku (Northeastern) coast of Japan in November 1964. The Soviet fish-

U.S.S.R. (Contd.):

ing fleet (organized on the basis of one 2,500- to 3,000-ton class mothership to every ten 200- to 300-ton fishing vessels) was reported fishing for saury. Unlike 1963 when the Soviet vessels were observed to be test fishing with suction pumps, the great majority of the vessels in 1964 was using the Japanese method of fishing with lights and pole-held dip nets.

Later that month, a report received by the Japan Maritime Safety Second District Headquarters indicated that two 8,000-ton mother-ships accompanied by some 10 vessels were fishing for saury about 17 miles southeast off the Shiogama (Miyagi Prefecture) lighthouse. (Minato Shimbun, November 21; Suisancho Nippo, November 14, 1964.)

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ELECTRICAL FISHING
WITH LIGHTS AND PUMPS:

Following is a description of Soviet light-and-pump-fishing methods as reported by a member of the Soviet State Committee for Fisheries and published in World Fishing, June 1964:

Caspian Sea: Soviet fishermen are using lights and pumps in the Caspian Sea to catch sprat on a commercial scale. (The method was first used in 1954 to catch Caspian sprats.) At night, bright lamps and a suction system are lowered into water where fish



Lights and pumps used to fish sprat ("kilka") in the Caspian Sea off Baku. Man on left stands on the drive-shaft housing between the electric driving motor (left) and the fish pump (near his right foot). Suction hose can be seen passing under the fish box and over the railing (right rear). Man on the left is holding on to water-fish separator; fish trickle down the chute into hopper (center) while the water flows back into the sea (left rear).

schools are expected to pass. The suction system is hauled aboard at dawn. When the tip emerges from the water, the lights are put out and the water is promptly pumped out of the hoses, which bob up and are pulled on board.

At present, suction fishing in the Caspian Sea is done by large vessels fitted with 1 or 2 pumping systems. Equipped in that manner, a vessel of 700 tons displacement can catch up to 70 metric tons a night. By 1963, Soviet fishermen in the Caspian Sea were catching more fish with suction pumps than with nets (see table). In some cases, a vessel with pumps produced 2 or 3 times more than a comparable vessel fishing with nets. The use of pumps also save a lot of manual effort.

Soviet Sprat Catch in the Caspian Sea by Nets and Pumps, 1963 with Comparisons			
Year	Nets	Pumps	Total
	(1,000 Metric Tons)		
1963	122.0	136.7	258.7
1962	132.7	92.0	224.7
1957	149.1	25.9	175.0
1954	91.3	0.1	91.4

Pacific Ocean: The Soviets are testing a modified pump-fishing method on saury in the Pacific. Early experiments showed that saury could evade an ordinary pump even though the fish were attracted by the lights in the suction-fishing system. It was found, however, that saury could be trapped by an electrical field. In a direct current electric field, saury instinctively move in the direction of the anode.

Those principles were used in the modified pump system designed to catch saury. The modified gear includes a fish pump and a direct current electrical unit (9 kilowatts, 30 volts, 400 amperes) to build up an electric field where saury are concentrated. Two steel pipes lowered into the water from the bow and stern of a fishing vessel serve as the cathode of the electrical system. The suction pump, with an insulated outer surface serves as the anode.

When the system is operating, saury are lured into the effective zone of the pump by a 500-watt red-light source placed 0.5 to 1.0 meters (1.6 to 3.3 feet) above the water surface and aligned with the center of the suction pump under water. Direct current applied to the electrodes 5-10 seconds after the red light is put on attracts fish to the suction pump (the anode), and the pump sucks the fish in.

U.S.S.R. (Contd.):

Using that method, the Yuri Gagarin (a medium trawler) took more than 50 tons of saury in 12 days. One night the catch reached 20 tons, which evidently is not the limit.

Note: See Commercial Fisheries Review, July 1964 p. 76.

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FACTORY-TYPE WHALING IN NORTH PACIFIC OCEAN:

Whaling operations in the North Pacific Ocean by the Soviet Union were described by the Director of Japan's Whale Research Institute, in an article appearing in the Japanese periodical Geiken Tsushin (Whaling Report) No. 135, July 1964. A summary translation of the article follows:

The U.S.S.R. has a long history of factory-type whaling in the North Pacific. The mother-ship Aleut was the only vessel engaged in that type of whaling before World War II. After the war, in addition to operating the Aleut, the U.S.S.R. established a land-based whaling station on the Kuriles. This station is still maintained and operated although there have been rumors that it would be abolished. In recent years emphasis has been placed on the expansion of pelagic whaling, and as of mid-July 1964 four factoryships were engaged in whaling in the North Pacific. In 1962, the vessel Sovietskaya Russia which had been engaged in Antarctic whaling joined the Aleut in the North Pacific operation. In 1963, two newly constructed vessels (the Dalni Vostok and the Vladivostok) were added to the fleet.

The catch of whales by the Soviet mother-ship fleet for 1963 included an especially large number of blue, humpback, and sperm whales during that year. A total of 9,291 whales was taken by the Soviets in the North Pacific Ocean in 1963. Of that total, 347 were blue whales, 2,242 humpback whales, and 5,125 sperm whales. At the current rate of catch blue and humpback whales will become extinct.

From 1959 to 1963, the Soviet Union expanded its whale fishery eastward. During the 1963 season it had expanded its whaling area eastward to include the entire Gulf of Alaska, with the Soviet fleet operating that year east of 130 degrees west. In addition to the expansion of the fishing area in the Gulf of Alaska in 1963, the U.S.S.R. was engaged in whaling in the North Bering Sea. Thus all waters of the North Pacific, with the exception of the Arctic Ocean are covered by

the U.S.S.R. whaling fleet. (Fisheries Attache, United States Embassy, Tokyo, November 6, 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 114; November 1964 p. 16; September 1964 p. 10.

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SOVIET WHALING FLEET PLANS PRESEASON HUNTING IN ANTARCTIC FOR TOOTHED SPERM WHALES:

A British periodical reported in mid-October 1964 that the Soviet joint whaling fleet of Sovietskaya Ukraina and Slava was ready to leave for the Antarctic.

The captain of the Soviet expedition said it would sail along a new route via the Suez Canal. That would make it possible to reach the whaling area two weeks earlier than usual, and to begin hunting toothed sperm whales which, according to the International Whaling Convention, can be caught at any time of the year. (Fishing News, London, October 16, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 72.



United Kingdom

FISHING LIMITS EXTENDED TO 12 MILES:

The extension of British fishing limits to 12 miles became effective September 30, 1964. At the same time, straight baselines enclosing a number of bays and channels were established by the Territorial Waters Order-in-Council of the British Government. The waters of the Scottish Hebrides Islands are the most notable area enclosed by the new baselines. English waters enclosed include Bristol Channel and The Wash.

Certain rights to continue fishing within the new British limits have been extended to fishing vessels of the foreign countries which endorsed the European Fisheries Convention. Those countries are Belgium, Denmark, France, West Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Austria, and Sweden. Fishing vessels of those countries will be allowed to fish within the British 6- to 12-mile zone, but only for the stocks and on the grounds which they have habitually fished during the 10 years ending in 1963. They will also, for an initial transitional period, be allowed to fish in areas with-

United Kingdom (Contd.):

in the 3- to 6-mile British zone where traditional rights have been established.

Along most of the British coast, foreign fishing in the 3- to 6-mile zone will end on December 31, 1965, but where straight base-lines or bay-closing lines more than 10 miles in length are drawn, the transitional period extends until the end of 1966. The end of the transitional period will see foreign vessels completely excluded from the inner 6 miles of the new British 12-mile limit.

The habitual rights of the various Convention countries have been defined in a series of Designation Orders by the British Government, specifying the areas and species which the vessels of each country may fish.

Similar orders have also been made giving effect to bilateral agreements with two countries which are not parties to the European Fisheries Convention, but which have fished within the new limits. An agreement has been made with Norway giving Norwegian vessels the right to fish for dogfish and basking sharks in certain areas between 6 and 12 miles until 1984, with transitional rights between 3 and 6 miles for those fish only.

A second agreement has also been concluded giving Polish vessels the right to fish for herring between 6 and 12 miles along part of the northeast coast of England until the end of 1967. Discussions have also been held with the U.S.S.R. The Soviets, however, seem mainly interested in securing the right to enter sheltered British waters to transfer catches to motherships.

Foreign vessels fishing within British fishing limits will be subject to British fisheries jurisdiction. British conservation regulations were extended to foreign vessels within the 12-mile limit by the British Sea-Fishing Industry (Nets of British and Foreign Fishing Boats) Orders 1964, which went into effect on November 1, 1964. (Fishing News, London, October 2, 1964.)

Note: See Commercial Fisheries Review, September 1964 p. 49; May 1964 p. 40.

* * * * *

CANNED SARDINE SUPPLY SITUATION:

It appears that there are no large quantities of canned sardines stored in the United Kingdom. The leading British firm

producing canned sardines can accept no large orders, according to its managing director. He said that most of the current British production of canned sardines had been sold. He also indicated that there is normally little carryover of canned sardine stocks in Britain from year to year. Sprat canned in the United Kingdom is sold for export as sardines, but on the British market it is labeled brisling. Some canned brisling is also imported from Norway. Also, there are imports of canned sardines mostly from Portugal--the only fish product permitted to be sold on the British market as sardines.

Sprat are caught off the east coast of Great Britain. There is no legal limit on the British sprat season; it is controlled only by the availability of the fish in coastal waters. In general, British fishermen catch sprat from October to February off the English coast and from September to February off the Scottish coast.

The British Ministry of Agriculture, Fisheries, and Food reported total sprat landings in English and Welsh ports during 1963 of 6,163 long tons with a total ex-vessel value of £83,179 (US\$232,901). That represents a rise of only 100 tons over the 1962 landings. Sprat landings in Scottish ports, however, established a record during the 1962/63 season when 30,000 long tons were landed, or 3 times as much as in any previous postwar season, according to the British Department of Agriculture and Fisheries for Scotland. It was stated that cold weather may have helped bring large schools of sprat into coastal waters during the 1962/63 Scottish season.

There are approximately 6 British plants classifiable as sardine canneries, although all of them process other types of fish and, in some cases, vegetables and other foods. To the extent possible, sprat are processed immediately after being landed. Normally, about one-half the catch is canned during the fishing season; the remainder is frozen and canned during the rest of the year. The majority of workers in British sardine canneries are women; they are paid on a piece-work basis; and their weekly average wage is about \$28.00. (United States Embassy, London, November 11, 1964.)

* * * * *

NEW BRITISH IMPORT SURCHARGE DOES NOT APPLY TO FISH AND FISH PREPARATIONS NOR TO CERTAIN FISHING VESSELS:

Foodstuffs and basic raw materials are not subject to the new temporary import ad valorem surcharge (15 percent) levied by the British Government as of October 27, 1964. Fish (tariff 03.01-03.03) and preparations of meat and fish (tariff 16.01-16.05) are covered by the exemption for foodstuffs.

Also excluded from the new import surcharge are fishing vessels of 80 gross tons or more (tariff 89.03A) and fishing vessels of the kind commonly known as Danish-type seiners (tariff 89.01B).

The temporary 15-percent import surcharge will be in effect until November 30, 1965, when it may be renewed for a further period of not more than 1 year. But the British Government also will review its balance-of-payments position in the spring of 1965 to determine if the surcharge can be reduced or

United Kingdom (Contd.):

abolished before November 30, 1965. (British Record, Nos. 14 and 17, November 1964.)

* * * * *

UNDERWATER "SOUND WAVE SEARCHLIGHT" DEVELOPED FOR FISHERIES USE:

British scientists have developed an underwater "sound wave searchlight" with a maximum range of 100 yards. At that range, it is said to be much more effective than traditional echo-sounding equipment. The "sound wave searchlight" is said to give a more detailed picture of the underwater world.

Sound waves, which travel 5 times as fast in water as they do in air, have been used for many years in underwater detection devices. They, however, produce a fixed beam, which gives its results simply as an echo or no echo. The new "searchlight" is reported to be more of the equivalent of an underwater radar. It transmits sound at 500 kilocycles a second in pulses 100 millionths of a second in length in a beam 30 degrees across. The maximum range is 100 yards.

Echoes from the transmitted sound are "scanned" electronically across the beam at speeds up to 10,000 times a second. That means that the resolution--or how well the equipment can distinguish objects--is extremely good; something only 6 inches in length is discernible. Output from the echo signal is presented on a television-type tube so that the range and bearing of the moving "blips" can be seen easily.

Sea trials have confirmed the performance of the equipment, which is now being manufactured for commercial tests. It had previously been used in laboratory research on fish behavior. (The South African Shipping News and Fishing Industry Review, August 1964.)



Viet-Nam

INCREASE IN SHRIMP EXPORTS PLANNED:

In 1964 Viet-Nam made trial shipments of frozen shrimp for market testing in the United States, Europe, and Asiatic countries. During the year, repeat shipments of frozen

shrimp amounting to some 35,000 pounds were made to Hong Kong, Japan, France, Holland, Switzerland, and the United States.

Viet-Nam's fishery products exports, including shrimp, were expected to increase with the completion of additional fish landing facilities in that country. (United States Embassy, Saigon, November 6, 1964.)



Yugoslavia

TUNA VESSELS BEING BUILT WITH AID OF FOREIGN KNOW-HOW:

Three 145-foot tuna purse seiners designed by a United States firm in Seattle, Wash., are under construction by a shipyard in Pula, Yugoslavia. Deliveries to a Yugoslavia fishing company, also of Pula, are scheduled for May, July, and September 1965.

The vessels will have a carrying capacity of 475 metric tons of tuna. Engines of 1,560 horsepower will be supplied by a Yugoslav firm which will build the engines under license from a Danish firm.

Hydraulic-powered fishing gear, including power blocks, main seine winches, and other deck machinery, will be supplied by the Seattle designing firm. (The South African Shipping News and Fishing Industry Review, September 1964.)

* * * * *

CANNED FISHERY PRODUCTS OUTPUT, 1963 AND JANUARY-JUNE 1964:

In 1963, Yugoslavia produced a record 27,452 metric tons of canned fishery products,



Women at a Yugoslav cannery preparing fish for cooking in wire baskets prior to canning operations.

Yugoslavia (Contd.):

exceeding 1962 production by 8,079 tons or about 30 percent. During the first 6 months of 1964, Yugoslav output of canned fishery products reached 14,046 metric tons, only 8

percent above production in January-June 1963. That indicates the trend toward increased canned production, which started in the late 1950's, will continue, though on a more modest scale. (Savezni Zavod Za Statistiku Indeks, September 1964.)



SEA OTTER POPULATIONS MAY BE TRANSPLANTED TO MORE ACCESSIBLE SITE

Sea otters have been absent from the Alaska "Panhandle" for a half century or more but may once again occupy that eastern portion of their former habitat. From communities in the more remote parts of the Aleutian Islands, which remained untouched by hunters during the latter part of the 18th into the 19th centuries, the otter has spread again through much of its former range.

Otters are now becoming more abundant in parts of Prince William Sound in Alaska. Plans are being made by the Alaska Department of Fish and Game to help them migrate south and east from there to the Alexander Archipelago, an area consisting of numerous islands in the waters of southeastern Alaska.

An aerial and SCUBA search by biologists of the Alaska Department of Fish and Game this past April disclosed at least one area in the Panhandle where a proposed transplant of sea otters would have an excellent chance of success. According to the biologists, the proposed release site on the west side of Chichagof Island has a good supply of sea otter requirements. These requirements include food of the proper kinds, protected rocky and sandy beaches, and isolation from human activities.

The chief biologist of Alaska's Division of Game, who is in charge of transplants, said that the remaining major obstacle to a full-scale reintroduction of the otter to a new area, is the difficulty in capturing an adequate number of them within a short enough period of time so that none would have to be kept long in captivity. Sea otters depend on their thick fur for insulation, he pointed out, and when it becomes matted--as it is prone to do quickly in captivity unless elaborate and costly facilities are provided--the animals get wet to the skin and die from exposure.

The Department's biologists are trying to devise a capture method which will improve on the one-by-one, two-or-three-a-week methods which have heretofore been used. An attempt to use a "cannon net," like those used for capturing some kinds of birds, was unsuccessful when tried earlier, partly because of weather conditions.

The biologist in charge of the Alaska Division of Game's sea otter investigations said that if a promising capture method could be found reasonably soon, a small pilot transplant of the otters was to be attempted before the end of 1964. Full-scale moving of sea otters could then begin in 1965, utilizing experience and knowledge gained in the pilot transplant. The animals will be moved from Prince William Sound to Chichagof by amphibious airplane, the biologist said. (Alaska Department of Fish and Game, Juneau, May 1, 1964.)



FEDERAL ACTIONS



Department of Health, Education, and Welfare

PUBLIC HEALTH SERVICE

AMENDMENTS PROPOSED TO REGULATIONS FOR MEDICAL CARE OF COMMERCIAL FISHING VESSEL OWNER OPERATORS:

A notice to amend regulations on eligibility for medical care of owner-operators of commercial fishing vessels (5 gross tons and over) under Part 32 Title 42, Code of Federal Regulations (Medical Care for Seamen and Certain Other Persons), was issued by the U.S. Public Health Service, Department of Health, Edu-

cation, and Welfare, and published in the Federal Register, November 10, 1964.

The proposed amendments to Part 32 are on sections covering meaning of terms, persons eligible, and conditions and extent of treatment.

It is proposed to make any amendments that are adopted finally effective immediately upon publication in the Federal Register.

Interested persons were given until December 10, 1964, in which to present data, views, and arguments in writing regarding the proposal.

The proposed regulations as they appeared in the Federal Register follow:

DEPARTMENT OF HEALTH, EDU- CATION, AND WELFARE

Public Health Service

[42 CFR Part 32]

MEDICAL CARE FOR SEAMEN AND CERTAIN OTHER PERSONS

Notice of Proposed Rule Making

Notice is hereby given that the Surgeon General of the Public Health Service, with the approval of the Secretary, proposes to amend Part 32 of Title 42, Code of Federal Regulations. As set out below, the amendments relate to eligibility for medical care of owner-operators of commercial fishing vessels.

Notice is also given that it is proposed to make any amendments that are adopted effective immediately upon publication in the FEDERAL REGISTER.

Interested persons may present data, views, and arguments in writing, in duplicate, to the Surgeon General, Public Health Service, Washington, D.C., 20201.

All relevant material received not later than 30 days after publication of this notice in the FEDERAL REGISTER will be considered.

Part 32 would be amended as follows:
1. Section 32.1 would be amended by

adding a new paragraph (1), to read as follows:

§ 32.1 Meaning of terms.

(1) "Commercial fishing operations" means the gathering of any form of either fresh water or marine animal life for sale on a commercial basis through available markets.

2. Section 32.6(a) would be amended by adding a new subparagraph (12), to read as follows:

§ 32.6 Persons eligible.

(a) Under this part the following persons are entitled to care and treatment by the Service as hereinafter prescribed:

(12) Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations.

3. A new center heading and a new § 32.57 would be added, to read as follows:

OWNER-OPERATORS OF COMMERCIAL FISHING VESSELS

§ 32.57 Conditions and extent of treatment.

Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations shall be entitled to care and treatment by the Service under the same conditions, where applicable, and to the same extent as is provided for American seamen.

(Sec. 215, 58 Stat. 690, as amended; 42 U.S.C. 216. Interpret or apply sec. 322, 58 Stat. 698, as amended by 78 Stat. 398; 42 U.S.C. 249)

Dated: October 21, 1964.

[SEAL]

LUTHER L. TERRY,
Surgeon General.

Approved: November 3, 1964.

ANTHONY J. CELEBREZZE,
Secretary.



Department of the Interior

BUREAU OF COMMERCIAL FISHERIES

FISHING VESSEL CONSTRUCTION SUBSIDY REGULATIONS ADOPTED:

Regulations governing the payment of subsidies under the United States Fishing Fleet Improvement Act (P. L. 88-498) have been adopted as a revision of Part 256, Subchapter F, Chapter II, Title 50, Code of Federal Regulations, and published in the Federal Register of December 2, 1964, and were to become effective December 22, 1964. Rules and regulations governing the Notice and Hearing provisions of the Act were adopted as Part 257 of the above Subchapter and published in the Federal Register of December 11, 1964, and were to become effective December 31, 1964.

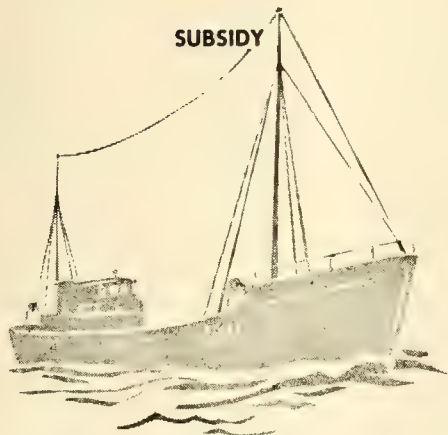
Part 256 of the regulations says a commercial fisherman can, under certain conditions, be reimbursed by the U. S. Government for the difference between the cost of building a vessel in U. S. shipyards and in less expensive foreign shipyards. The amount of reimbursement cannot exceed one-half of the U. S. cost.

FISHING VESSEL

CONSTRUCTION

DIFFERENTIAL

SUBSIDY



UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Branch of Loans and Grants
Washington, D. C. 20240

Eligibility for the subsidy is restricted to vessels of advanced design, capable of fishing in expanded areas (fishing grounds not usually fished by the majority of vessels working in a particular fishery), equipped with newly developed gear, and scheduled for operation in a fishery where such use will not cause economic hardship to other operators in that fishery. ("Newly developed gear" is defined as the most modern gear available that is suitable for use in the fishery for which the proposed vessel is designed.)

The regulations provide for hearings on each contract under the new law. Such hearings will allow any person who feels he will be economically injured by the construction of the proposed vessel an opportunity to present evidence of potential economic losses.

The United States Fishing Fleet Improvement Act authorized the appropriation of \$10 million annually for the construction subsidy program. Congress has appropriated \$2½ million to start the program during the current fiscal year (ending June 30, 1965).

Information regarding the program and application forms may be obtained from the Branch of Loans and Grants, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240; or from any of the Bureau's Regional Offices.

Following are the revised Fishing Vessel Construction Differential Subsidy Procedures (50 CFR Part 256 and Part 257) as published in the Federal Register, December 2 and 11, 1964:

Title 50—WILDLIFE AND FISHERIES

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBCHAPTER F—AID TO FISHERIES

PART 256—FISHING VESSEL CON- STRUCTION DIFFERENTIAL SUBSIDY PROCEDURES

On page 13902 of the FEDERAL REGISTER of October 8, 1964, there was published a notice and text of a proposed revision of Part 256. The purpose of the revision is to incorporate those changes necessitated by the enactment of the United States Fishing Fleet Improvement Act (P.L. 88-498) which was approved August 30, 1964. Due to the numerous changes being proposed, the procedures will be more readily understood if the entire part is published in revised form.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed revision. Several comments and suggestions were received and all have been considered. The proposed revision is hereby adopted so as to include applicable suggested changes.

These regulations shall become effective at the beginning of the 20th calendar day following the date of publication in the *FEDERAL REGISTER*.

Part 256 is revised to read as follows:

- Sec.
256.1 Basis and purpose.
256.2 Definitions.
256.3 Eligibility requirements.
256.4 Applications.
256.5 Notice and hearing.
256.6 Subsidy contract.
256.7 Vessel operations.
256.8 Penalties.
256.9 Inspection of vessels.
256.10 Payment of subsidy.

AUTHORITY: The provisions of this Part 256 issued under sec. 10, Public Law 86-516, as amended.

§ 256.1 Basis and purpose.

(a) The Act of June 12, 1960 (Public Law 86-516), as amended and herein-after referred to as the Act, authorizes the Secretary of the Interior to pay a subsidy for the construction of fishing vessels in shipyards of the United States.

(b) The purpose of this part is to prescribe rules and regulations governing the payment of these subsidies.

§ 256.2 Definitions.

(a) Secretary. The Secretary of the Interior or his authorized representative.

(b) Administrator. The Maritime Administrator in the Department of Commerce or his authorized representative.

(c) Director. The Director, Bureau of Commercial Fisheries, Department of the Interior, or his authorized representative.

(d) Person. Individual, association, partnership or corporation, or any one or all as the context requires.

(e) Fishery. A segment of the commercial fishing industry engaged in the catching of a single species or a group of species of fish and shellfish. Any other species taken must be caught incidentally while fishing for and using gear designed for the capture of the species comprising the fishery.

(f) Expanded areas. Fishing grounds not usually fished by the majority of the vessels operating in the fishery for which the proposed vessel is designed.

(g) Newly developed gear. The most modern gear available that is suitable for use in the fishery for which the proposed vessel is designed.

§ 256.3 Eligibility requirements.

(a) Vessel will be of advance design: In order to be considered to be of advance design, the vessel must be designed to have significant advantages in utility and efficiency over a significant number of vessels engaged in the fishery in which the proposed vessel is designed to operate.

(b) No economic hardship to efficient vessel operators: The determination that operation of a proposed vessel will not cause economic hardship to efficient

vessel operators already operating in that fishery shall be made by the Secretary after notice and hearing, taking into consideration the condition of the resource, the efficiency of the vessels and gear being operated in that fishery compared with the proposed vessel, the prospects of the market for the species caught, and the degree and duration of any anticipated economic hardship.

(c) Aid in the development of the United States fisheries: For the vessel to aid in the development of the United States fisheries under conditions that the Secretary considers to be in the public interest, the vessel must be a modern vessel which will upgrade the fleet. Special consideration will be given to vessels which will provide a significant contribution in helping the domestic fishery meet foreign competition.

(d) The applicant possesses the ability, experience, resources and other qualifications necessary to enable him to operate and maintain the proposed new fishing vessel. In making this determination, the Secretary will inquire into the economic feasibility of the fishing venture and will require reasonable assurance that the applicant can operate the vessel profitably.

§ 256.4 Applications.

Applications for a subsidy shall be made on forms prescribed by the Secretary and shall be filed with the Director, Bureau of Commercial Fisheries, Washington, D.C. The applications must be accompanied by three copies of the cross section, deck arrangement, outboard profile, and specifications of the proposed vessel. The Secretary may require such additional complete detailed construction plans as may be necessary after a review of the application and accompanying plans and specifications.

§ 256.5 Notice and hearing.

After receipt of an application eligible on its face for a construction differential subsidy the Director will publish a Notice of Hearing on a Subsidy Application in the *FEDERAL REGISTER* and hold hearings in accordance therewith. The purpose of the hearing will be to provide any person who feels he will be economically injured by the construction of the proposed vessel to cross-examine witnesses and/or present evidence that the operation of such vessel will cause economic hardship to efficient vessel operators already operating in the fishery for which the vessel is designed. Hearing procedures will be held in accordance with Part 257 of this subchapter.

§ 256.6 Subsidy contract.

(a) A contract for the payment of the subsidy will take effect when all contracts for the construction of such vessel, have been approved by the Administrator and the subsidy contract has been signed by the Secretary and the applicant; and

(b) The contract shall contain a finding of the useful life of the vessel as determined by the Secretary to be used in computing the amount of the total depreciated construction subsidy to be repaid to the Secretary in accordance with section 9 of the Act.

§ 256.7 Vessel operations.

(a) If the owner of a fishing vessel constructed with the aid of a subsidy desires to operate it in a different fishery

than the one for which it was designed because of an actual decline in that particular fishery, he shall submit an application to the Secretary for permission to transfer the operations of the vessel to a different fishery. The application shall contain data showing the decline in the fishery for which the vessel was designed, how this decline is making the operation of the vessel uneconomical or less economical, and why the transfer will not cause economic hardship or injury to efficient vessel operators already operating in the fishery to which he wishes to transfer operations.

(b) Upon receipt of such an application the Secretary will publish a Notice of Hearing on an Application to Change Fishery in the *FEDERAL REGISTER* and hold hearings in accordance therewith. The purpose of the hearings will be to provide any person who feels he will be economically injured by said transfer of fishing operations an opportunity to cross-examine witnesses and/or present evidence that such a transfer of operations will cause economic hardship or injury to efficient vessel operators already operating in the fishery to which the vessel's operations would be transferred. Hearing procedures will be held in accordance with Part 257 of this subchapter.

§ 256.8 Penalties.

In case the Secretary shall find that a vessel has operated contrary to the provisions of the Act or of regulations issued thereunder, he shall immediately notify the owner in writing of the specific acts involved and the amount of the penalty. The vessel owner may appeal such a finding to the Secretary in writing within 30 days of the date of mailing such finding to the last known address of the vessel owner. The amount of penalty assessed in any one year shall be equal to the total subsidy paid multiplied by the ratio that one year bears to the total number of years determined, by the Secretary, as the useful life of the vessel: *Provided, however*, That if the amount is not paid within 60 days after receipt of notice then the amount due shall be the total amount of the subsidy paid depreciated to the beginning of the year in which the vessel operated unlawfully. Any amount due hereunder shall constitute a maritime lien against the vessel effective at the time the Secretary determines that the vessel has operated in violation of the Act or regulations.

§ 256.9 Inspection of vessels.

The Secretary or the Administrator shall have access at all times to all vessels which are being constructed under a contract providing for a construction subsidy provided for by the Act.

§ 256.10 Payment of subsidy.

Subsidy payments will be paid in accordance with the terms of the subsidy contract. No subsidy payments shall be made until the entire amount of the applicant's share of the subsidized construction cost has been paid. If the amount of subsidy exceeds 30 percent of the subsidized construction cost, an amount equal to at least 30 percent of the subsidized construction cost shall be withheld until (a) the Maritime Administrator has certified that the vessel has been completed in accordance with the approved plans and specifications, and (b) all amounts due by the applicant

on account of the construction of the vessel, including designing, equipping, and outfitting costs, have been paid. Any interim subsidy payments due pursuant to the subsidy contract shall be paid only after the Secretary has determined that such amount is properly due. If the amount of subsidy does not exceed 30 percent of the subsidized construction cost, none of the subsidy shall be paid until (a) the Maritime Administrator has certified that the vessel has been completed in accordance with the approved plans and specifications, and (b) all amounts due by the applicant on account of the construction of the vessel, including designing, equipping, and outfitting costs, have been paid. Subsidy payments may be made to the applicant or jointly to the applicant and construction contractor or others, as may be appropriate, pursuant to the terms of the construction contract or otherwise.

STEWART L. UDALL,
Secretary of the Interior.

NOVEMBER 25, 1964.

PART 257—NOTICE AND HEARING ON SUBSIDIES

On pages 14744 to 14746 of the *FEDERAL REGISTER* of October 29, 1964, there was published a notice of proposed rule making to issue regulations governing the procedures for the notice and hearing requirements of the United States Fishing Fleet Improvement Act (Public Law 88-498). Interested persons were given 20 days in which to submit written comments, suggestions, or objections with respect to the proposed regulations.

No objections have been received and the only suggestion submitted does not require a revision of the proposal.

The proposed regulations are hereby adopted without change and are set forth below. This part shall become effective at the beginning of the 20th calendar day following the date of this publication in the *FEDERAL REGISTER*.

STEWART L. UDALL,
Secretary of the Interior.

DECEMBER 8, 1964.

- Sec.
257.1 Basis and purpose.
257.2 Definitions.
257.3 Scope of rules.
257.4 Mailing address.
257.5 Authentication.
257.6 Inspection of records.
257.7 Appearance and practice.
257.8 Parties.
257.9 Form, execution and service of documents.
257.10 Notice, pleadings and replies.
257.11 Duties of Presiding Officer.
257.12 Hearing procedure.
257.13 Evidence.
257.14 The record.
257.15 Decisions.

AUTHORITY: The provisions of this Part 257 issued under the Act of June 12, 1960 (Public Law 86-516), as amended.

§ 257.1 Basis and purpose.

(a) The Act of June 12, 1960 (Public Law 86-516), as amended by the United States Fishing Fleet Improvement Act (Public Law 88-498) authorizes the Secretary of the Interior to pay a subsidy for the construction of fishing vessels in shipyards of the United States and requires that this be done only after Notice and Hearing.

(b) The purpose of this part is to establish rules of practice and procedure for the notice and hearing.

§ 257.2 Definitions.

Definitions shall be the same as in Part 256 of this subchapter.

§ 257.3 Scope of rules.

The regulations in this part govern the procedure in hearings subject to Part 256 of this subchapter. These hearings are subject to the Administrative Procedure Act (5 U.S.C. 1003, et seq.) and Practice Before The Department of the Interior (43 CFR Part 1). The regulations shall be construed to secure the just, speedy, and inexpensive determination of every proceeding with full protection for the rights of all parties therein.

§ 257.4 Mailing address.

Documents required to be filed in, and correspondence relating to, proceedings governed by the regulations in this part shall be addressed to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C., 20240.

§ 257.5 Authentication.

All rules, orders, determinations, and decisions of the Secretary shall be signed by the Secretary.

§ 257.6 Inspection of records.

The files and records of these hearings, except those held by the Secretary for good/cause to be confidential, shall be open to inspection and copying as follows:

(a) All pleadings, motions, depositions, correspondence, exhibits, transcripts of testimony, exceptions, briefs, and decisions in any formal proceeding under this part may be inspected and copied in the office of the Chief, Branch of Loans and Grants, Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C., 20240.

§ 257.7 Appearance and practice.

(a) A party may appear in person or by an officer, partner or regular employee of the party; by or with counsel or as otherwise permitted by 43 CFR Part 1 in any proceeding under the regulations in this part. A party may offer testimony, produce and examine witnesses, and be heard upon brief and at oral argument if oral argument is granted by the Presiding Officer. Attorneys-at-law who are admitted to practice before the Federal Courts or before the courts of any State or possession of the United States, may represent a party as counsel.

(b) Persons who appear at any hearing shall deliver a written notice of appearance to the official reporter, stating for whom the appearance is being made. The Presiding Officer may require a person making an appearance in a representative capacity to show his authority to act in such capacity. The written appearance shall be made a part of the record.

§ 257.8 Parties.

(a) The term "party" shall include any natural person, corporation, association, firm, partnership, trustee, receiver, cooperative or governmental agency determined by the Presiding Officer as having an interest in the proceedings. A party making an application shall be

designated as "applicant." A party whose petition for leave to intervene is granted shall be designated an "intervenor." Only a party as designated in this section may introduce evidence or examine witnesses at hearings.

(b) For an intervenor to prove an interest in the hearings he must show that there is a reason for belief that the operation of the vessel described in the application will cause economic injury or hardship to efficient vessel operators already operating in the fishery in which it is proposed that the vessel be operated.

§ 257.9 Form, execution and service of documents.

(a) All papers to be filed under the regulations in this part shall be clear and legible; and shall be dated, signed in ink, contain the docket description and title of the proceeding and the title, if any, and the address of the signatory. Five copies of all papers are required to be filed. Documents filed shall be executed by (1) the person or persons filing same, (2) by an authorized officer thereof if it be a corporation or, (3) by an attorney or other person having authority with respect thereto.

(b) All documents, when filed, shall show that service has been made upon all parties to the proceeding. Such service shall be made by delivering one copy to each party in person or by mailing by first class mail, properly addressed with postage prepaid. When a party has appeared by attorney or other representative, service on such attorney or other representative will be deemed service upon the party. The date of service of document shall be the day when the matter served is deposited in the United States mail, shown by the postmark thereon, or is delivered in person, as the case may be.

(c) The original of every document filed under this part and required to be served upon all parties to a proceeding shall be accompanied by a certificate of service signed by the party making service, stating that such service has been made upon each party to the proceeding. Certificates of service may be in substantially the following form:

I hereby certify that I have this day served the foregoing document upon all parties of record in this proceeding by: (1) Mailing postage prepaid, (2) delivering in person, a copy to each party.

Dated at _____ this _____ day of _____ 19____
Signature _____

§ 257.10 Notice, pleadings and replies.

(a) After acceptance of an application eligible on its face for construction subsidy or for the transfer of a vessel to a different fishery, the Director, Bureau of Commercial Fisheries, shall publish a notice of hearing in the *FEDERAL REGISTER* advising that a hearing will be held not less than 30 days after date of such publication and setting the time and place and providing details with respect to such hearing. Any person desiring to intervene and present evidence that the approval of the application will cause economic injury or hardship to efficient vessel operators must file, at least 10 days prior to the date set for the hearing (unless otherwise consented to by the Presiding Officer), a Petition of Intervention setting forth his interest. The hearing will be held in Washington, D.C.,

unless such a petition is received. If such a petition is received, the Presiding Officer may designate a different hearing site by telegraphic notice to the parties in the proceedings. If no petition to intervene is received, it will not be necessary for the applicant to appear at the hearing if he files all information in writing as required by the Presiding Officer.

(b) All petitions shall be in writing and shall state the petitioner's grounds of interest in the subject matter; the facts relied upon, the relief sought; and shall cite the authority upon which the petition rests. The petition shall be served upon all parties named therein or affected thereby. Answers to petitions must be filed within 5 days of the hearing date, unless otherwise consented to by the Presiding Officer.

(c) Amendments or supplements to pleadings may be allowed or refused in the discretion of the Presiding Officer. The Presiding Officer may direct a party to state its case more fully and in more detail by way of amendment. If a response to an amended pleading is necessary, it may be filed and served within the time set by the Presiding Officer. Amendments or supplements allowed prior to hearing will be served in the same manner as the original pleading.

(d) All motions and requests for rulings shall state the relief sought, the authority relied upon and the facts alleged. If made before or after the hearing, such motions shall be in writing. If made at the hearing, motions may be stated orally: *Provided, however*, that the Presiding Officer may require such motion to be reduced to writing and filed and served in the same manner as a formal motion. Oral argument upon a written motion, in which an answer has been filed, may be granted within the discretion of the Presiding Officer. Answers to a formal motion or pleading shall be filed and served in the same manner as the motion or pleading.

§ 257.11 Duties of Presiding Officer.

The Presiding Officer shall have the authority and duty to:

- (a) Take or cause depositions to be taken.
- (b) Rule upon proposed amendments or supplements to motions and pleadings.
- (c) Regulate the course of the hearings.
- (d) Prescribe the order in which evidence shall be presented.
- (e) Dispose of procedural requests or similar matters.
- (f) Hear and initially rule upon all motions and petitions before him.
- (g) Administer oaths and affirmations.
- (h) Examine witnesses.
- (i) Rule upon offers of proof and receive competent, relevant, material, reliable, and probative evidence.
- (j) Exclude irrelevant, immaterial, incompetent, unreliable, repetitious or cumulative evidence.
- (k) Exclude cross-examination which is primarily intended to elicit self-serving declarations in favor of the witness.
- (l) Limit cross-examination to interrogatories which are required for a full and true disclosure of the facts in issue.
- (m) Act upon petitions to intervene.
- (n) Act upon submissions of facts or arguments.
- (o) Hear arguments at the close of testimony.

(p) Fix the time for filing briefs, motions and other documents to be filed in connection with hearings.

(q) Issue the initial decisions and dispose of any other pertinent matter that normally and properly arises in the course of proceedings.

§ 257.12 Hearing procedure.

(a) Unless authorized by the Presiding Officer, witnesses will not be permitted to read prepared testimony into the record. The evidentiary record shall be limited to factual and expert opinion testimony. Arguments will not be received in evidence but should be presented in opening and/or closing statements or in briefs to the Presiding Officer. All exhibits and responses to requests for evidence shall be numbered consecutively by the party submitting same and shall be filed with the Presiding Officer if filed during the hearing. If filed at some other time they should be filed in accordance with § 257.4 with one copy also being sent to each party to the hearing.

(b) Normally, the order of presentation at the hearing will be alphabetical in each of the following categories:

- (1) Applicant,
- (2) Intervenors.

Rebuttal should be presented without any adjournment in the proceedings.

(c) Cross-examination shall be limited, subject to § 257.13(b), to the scope of the direct examination and to witnesses whose testimony is adverse to the party desiring to cross-examine. Only cross-examination which is necessary to test the truth and completeness of the direct testimony and exhibits will be permitted.

(d) A request for oral argument at the close of testimony will be granted or denied by the Presiding Officer in his discretion.

(e) Rulings of the Presiding Officer may not be appealed prior to, or during, the course of the hearings, except in extraordinary circumstances where prompt decision by the Secretary is necessary to prevent unusual delay or expense, in which instance the matter shall be referred forthwith to the Secretary by the Presiding Officer. Any appeal shall be filed within 10 days from the date of the close of the hearing.

§ 257.13 Evidence.

(a) In any proceedings under this part, all evidence which is relevant, material, reliable and probative, and not unduly repetitious or cumulative, shall be admissible. Irrelevant and immaterial or unduly repetitious evidence shall be excluded.

(b) Each party shall have the right to present his case or defense by oral or documentary evidence, to submit rebuttal evidence; and to conduct such cross-examination as may be required for a full and true disclosure of the facts.

(c) At any time during the hearing the Presiding Officer may call for the production of further relevant and material evidence, reports, studies and analyses upon any issue, and require such evidence to be presented by the party or parties concerned, either at the hearing or adjournment thereof. Such material shall be received subject to appropriate motions, cross-examination and/or rebuttal. If a witness refuses to testify or produce the evidence as requested, the Presiding Officer shall forthwith report such refusal to the Secretary.

§ 257.14 The record.

(a) The Director, Bureau of Commercial Fisheries, will designate an official reporter for all hearings. The official transcript of testimony taken, together with any exhibits and briefs filed therewith, shall be filed with the Director, Bureau of Commercial Fisheries. Transcripts of testimony will be available in any proceeding under the regulations of this part, and will be supplied by the official reporter to the parties and to the public, except when required for good cause to be held confidential, at rates fixed by the contract between the United States of America and the reporter. If the reporter is an employee of the Department of the Interior, the rate will be fixed by the Director, Bureau of Commercial Fisheries.

(b) The transcript of testimony and exhibits, together with all papers and requests, including rulings and the initial decision filed in the proceeding, shall constitute the exclusive record for decision. The initial decision will be predicated on this same record, as will the final decision.

§ 257.15 Decisions.

(a) The Presiding Officer is delegated the authority to render initial decisions in all proceedings before him. The same officer who presides at the reception of evidence shall render the initial decision except when such officer becomes unavailable to the Department of the Interior. In such case, another Presiding Officer will be designated by the Secretary to render the initial decision. Briefs, or other documents, to be submitted after the hearing must be received not later than ten (10) days after the hearing unless otherwise extended by the Presiding Officer upon motion by a party. The initial decision shall be made within twenty (20) days after the hearing or the receipt of all briefs, whichever is later. If no appeals from the initial decision are received within ten (10) days of the date of the initial decision, it will become the final decision on the twentieth day following the date of the initial decision. If an appeal is received, the appeal will be transmitted to the Secretary who will render the final decision after considering the record and the appeal.

(b) All initial and final decisions, shall include a statement of findings and conclusions, as well as the reasons or basis therefor, upon the material issues presented. A copy of each decision shall be served on the parties to the proceeding, and furnished to interested persons upon request.

(c) Official notice may be taken of such matters as may be judicially noticed by the courts; or of technical or scientific facts within the general or specialized knowledge of the Department of the Interior as an expert body; or of a document required to be filed with or published by a duly constituted Government body: *Provided*, That where a decision or part thereof rests on the official notice of a material fact not appearing in the evidence of the record, the fact of official notice shall be so stated in the decision and any party, on timely request, shall be afforded an opportunity to show the contrary.

BUREAU OF INDIAN AFFAIRS

CHANGE PROPOSED IN INDIAN
COMMERCIAL FISHING REGULATIONS IN
ALASKAN ANNETTE ISLANDS RESERVE:

Indian commercial fishing in the Annette Islands Reserve of southeastern Alaska was the subject of a "Notice of Proposed Rule Making" published in the Federal Register, November 28, 1964, by the U. S. Department of the Interior. The Secretary of the Interior proposes to amend Title 25 Code of Federal Regulations Part 88 (Indian Fishing in Alaska), Sec. 88.3 and Sec. 88.6. The proposed amendment to Sec. 88.3 concerns closed waters. The proposed amendment to Sec. 88.6 concerns enforcement and fish traps. Following are the proposed amendments as published in the Federal Register, November 28, 1964:

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[25 CFR Part 88]

INDIAN FISHING IN ALASKA

Notice of Proposed Rule Making

Basis and purpose. Notice is hereby given that pursuant to the obligation imposed upon, and the authority vested in the Secretary of the Interior by 25 U.S.C. sections 2 and 9; 5 U.S.C. section 485; section 15 of the Act of March 3, 1891 (26 Stat. 1101, 48 U.S.C. section 358); the Presidential Proclamation of April 28, 1916 (39 Stat. 1777); section 2 of the Act of May 1, 1936 (49 Stat. 1259, 48 U.S.C. section 358a); and section 4 of the Act of July 7, 1958 (72 Stat. 339), as amended (73 Stat. 141), it is proposed to amend Part 88 of Title 25, Code of Federal Regulations by adding paragraph (f) to § 88.3 and revising paragraph (b) of § 88.6 as set forth below. The purpose of the amendment is to regulate and govern Indian commercial fishing in Alaska.

It is the policy of the Department of the Interior wherever practicable to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendment to the Bureau of Indian Affairs, Washington, D.C., 20240, within thirty days of the date of publication of this notice in the Federal Register.

1. Section 88.3 is amended by the addition of a new subparagraph (f) to read as follows:

§ 88.3 Commercial fishing, Annette Islands Reserve.

(f) Closed waters; commercial salmon fishing is prohibited at all times in the following areas:

(1) Tamgas Harbor north of the latitude of Deer Point.

(2) Streams and rivers of Annette Island and within 500 yards of the terminus, as defined herein, of any salmon stream or within such greater or lesser

distances from such terminus as may be specified in regulations having particular application to designated streams or areas. For the purpose of the regulations, the word "terminus" shall mean a line drawn between seaward extremities of the exposed tideland banks of any salmon stream at mean low tide. The facts as to the location of any such line may be ascertained from time to time by the Secretary of the Interior or such other persons he may designate. In accordance therewith the mouth of such creek, stream, or river shall be appropriately marked.

2. Section 88.6(b) is amended to read as follows:

§ 88.6 Enforcement; violation of regulations; corrective action; penalties; closure of restrictions, Annette Island Reserve.

(b) Whenever any duly authorized enforcement representative of the Secretary of the Interior has evidence that any violation of the regulations of this part relating to fish traps has occurred, he shall direct immediate closure of the trap involved and shall affix an appropriate seal thereto to prevent further fishing. The matter shall be reported without delay to the Area Director, Bureau of Indian Affairs, who shall thereupon report and recommend to the Secretary of the Interior appropriate corrective action.

JOHN A. CARVER, JR.,
Assistant Secretary of the Interior.

NOVEMBER 23, 1964.



Department of the Treasury

COAST GUARD

NEW INTERNATIONAL REGULATIONS
FOR PREVENTING COLLISIONS AT SEA:

The International Regulations for Preventing Collisions at Sea, 1960 (commonly called the 1960 International Rules of the Road), will become effective on September 1, 1965, replacing the 1948 International Rules of the Road which are now in effect. The new International Rules will not be effective, however, on United States waters governed by Inland, Great Lakes, or Western Rivers Rules of the Road. The new regulations were issued by the U. S. Coast Guard on September 1, 1964.

The revised rules were formulated by the maritime nations making up the Inter-Governmental Maritime Consultative Organization (IMCO), of which the United States is a member.

The pending 1960 International Rules of the Road make a number of changes, the most

significant of which concerns conduct in restricted visibility. Several important questions having to do with a vessel navigating with the aid of radar are resolved by the new Rules. Some of the new regulations are of interest and apply to fishing vessels.

In the United States, Congress through the Act of September 24, 1963 (P. L. 88-131),

authorized the President to proclaim the revised International Rules of the Road on or after the effective date announced by IMCO which is September 1, 1965. The revised Rules will apply to all public and private vessels and aircraft of United States registry covered by the legislation.

Note: Copies of the International Regulations for Preventing Collisions at Sea, 1960, are available from local Coast Guard Offices or from the U. S. Coast Guard, Washington, D. C.



TROUT FISHERY COOPERATIVE IN A DESERT

In one of the hottest, driest, and most savage deserts in the world, church workers are helping to build a fishery cooperative which aims at producing 100,000 rainbow trout a year. These will add badly needed protein to the diet of a depressed community and help to raise the people's standard of living.

The ponds where the trout are being raised are part of a cleft in an immense wasteland of rock-salt and volcanic ash at the foot of the Andes Mountains, Chile. Copper, iron, and other minerals are being mined on the flanks of those mountains.

It is a lunar landscape--fantastic, barren and menacing--and lit by a sunshine that is blinding and scorching. There is no rain. There are a few small, green oases where the presence of fresh water has enabled trees to grow and some sparse crops of maize, beans, and alfalfa to be raised.

The town of Calama, at an altitude of 7,400 feet, is the largest of the oases and is the capital of a territory as large as Switzerland.

But it is quite unable to feed itself. Within five years another 10,000 to 12,000 inhabitants have been added to Calama's population. Most of them live in shacks from cardboard, pieces of wood, sacking, and sheets of rusty tin. These shacks form 23 slum districts around the town.

Such a setting would seem to offer the fisherman no chance to pursue his profession, and an Argentinian agronomist and veterinarian was astonished, soon after he arrived in Calama, to meet two men walking across the desert carrying a 14-pound rainbow trout.

Recruited by the World Council of Churches to take part in a £36,000 (US\$100,000) community development project to help the churches deal with Calama's social situation, the Argentinian learned that the two men were, in fact, benefiting from the enthusiasm of an executive at the copper mine who had stocked a stream with trout but had then been recalled to the United States.

The trout had bred and multiplied.

The stream, springing out of the salt desert, provided exactly the right kind of water for trout to thrive in. Guided by the agronomist, 18 fishermen formed a cooperative and by March 1964 had made and stocked six ponds.

They plan to increase these to 100 by the end of the year. Each pond will contain 1,000 trout which the cooperative will sell in Calama at one-quarter the price of meat. (The Fishing News, June 26, 1964.)



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE
OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHING-
TON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOL-
LOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED
DISTRIBUTION).

- | Number | Title |
|----------|--|
| CFS-3247 | - Shrimp Landings, 1962 Annual Summary (Revised), 43 pp. |
| CFS-3563 | - Gulf Coast Shrimp Data, January 1964, 17 pp. |
| CFS-3566 | - Gulf Coast Shrimp Data, March 1964, 17 pp. |
| CFS-3583 | - Texas Landings, March 1964, 2 pp. |
| CFS-3584 | - Shrimp Landings, April 1964, 5 pp. |
| CFS-3586 | - Gulf Coast Shrimp Data, April 1964, 19 pp. |
| CFS-3589 | - Texas Landings, April 1964, 2 pp. |
| CFS-3590 | - New England Fisheries, 1963 Annual Summary, 10 pp. |
| CFS-3604 | - Texas Landings, May 1964, 2 pp. |
| CFS-3607 | - Virginia Landings, June 1964, 4 pp. |
| CFS-3613 | - Alabama Landings, April 1964, 3 pp. |
| CFS-3614 | - Alabama Landings, May 1964, 3 pp. |
| CFS-3617 | - Texas Landings, June 1964, 2 pp. |
| CFS-3618 | - Maryland Landings, July 1964, 4 pp. |
| CFS-3621 | - Georgia Landings, May 1964, 3 pp. |
| CFS-3622 | - Georgia Landings, June 1964, 3 pp. |
| CFS-3623 | - Georgia Landings, July 1964, 3 pp. |
| CFS-3625 | - Texas Landings, July 1964, 2 pp. |
| CFS-3626 | - New York Landings, July 1964, 5 pp. |
| CFS-3628 | - South Carolina Landings, March 1964, 2 pp. |
| CFS-3629 | - South Carolina Landings, April 1964, 2 pp. |
| CFS-3630 | - South Carolina Landings, May 1964, 2 pp. |
| CFS-3631 | - South Carolina Landings, June 1964, 3 pp. |
| CFS-3632 | - South Carolina Landings, July 1964, 3 pp. |
| CFS-3634 | - Florida Landings, July 1964, 8 pp. |
| CFS-3635 | - Louisiana Landings, July 1964, 3 pp. |
| CFS-3636 | - Shrimp Landings, June 1964, 5 pp. |
| CFS-3637 | - Gulf Coast Shrimp Data, June 1964, 25 pp. |
| CFS-3638 | - Maine Landings, July 1964, 4 pp. |
| CFS-3639 | - North Carolina Landings, August 1964, 4 pp. |
| CFS-3641 | - Rhode Island Landings, May 1964, 3 pp. |
| CFS-3642 | - Georgia Landings, August 1964, 3 pp. |
| CFS-3643 | - South Carolina Landings, August 1964, 3 pp. |
| CFS-3644 | - Maryland Landings, August 1964, 4 pp. |

- CFS-3645 - New Jersey Landings, July 1964, 3 pp.
CFS-3647 - Florida Landings, August 1964, 8 pp.
CFS-3649 - Fish Meal and Oil, August 1964, 2 pp.
CFS-3656 - Shrimp Landings, July 1964, 5 pp.

Sep. No. 714 - Soviet Far East Fisheries Expansion.

Sep. No. 715 - Overall View of Soviet Fisheries in 1963, with Emphasis on Activities off United States Coasts.

Sep. No. 716 - Supply, Sustained Yield, and Management of the Maine Lobster Resource.

Sep. No. 717 - Trawling Results of the R/V Anton Bruun in the Bay of Bengal and Arabian Sea.

Sep. No. 718 - Crab Industry of Chesapeake Bay and the South--An Industry in Transition.

Sep. No. 719 - Review of the Movement of Albacore Tuna Off the Pacific Coast in 1963.

Sep. No. 720 - (Salmon) Abernathy Spawning Channel Proves Effective for Reproduction of Chum Salmon.

Sep. No. 721 - Design and Operation of a Tray Rack for the Study of Oysters.

FL-46 - Dealers in Trout and Pondfishes, 77 pp., revised September 1964.

FL-190 - Turtle Trapping, 8 pp., illus., revised May 1964.

FL-411 - Care of Tropical Aquarium Fishes, 4 pp., revised May 1964.

FL-560 - Author Index of Publications, Addresses, and Translations - 1962, Bureau of Commercial Fisheries, Branches of Economics and Technology, by F. Bruce Sanford, Kathryn L. Osterhaug, and Helen E. Plastino, 10 pp., April 1964.

FL-563 - Pacific Salmon, by Clifford J. Burner, 12 pp., illus., September 1964. Discusses the five species of Pacific salmon--Oncorhynchus gorbuscha, O. tshawytscha, O. nerka, O. kisutch, and O. keta; general life history; food; migration; commercial importance; water problems; and research on salmon. Included are statistical tables showing data for 5 species of Pacific salmon occurring on the west coast of North America; commercial catch of salmon in Pacific Coast States, 1950-60; and value of commercial catch of salmon in Pacific Coast States, 1950-60.

FL-569 - The True Pikes, by Ernest G. Karvelis, 11 pp., illus., September 1964. Discusses scientific names of pikes, their common names, physical characteristics, occurrence, artificial propagation, and key to identification. Also describes in detail the characteristics of the muskellunge, northern pike, chain pickerel, grass pickerel, and redbfin pickerel.

FL-573 - Graduate Educational Grants in Aquatic Sciences for the Academic Year 1965-66, 4 pp., illus., October 1964.

SSR-Fish. No. 467 - Annual Fish Passage Report - Rock Island Dam, Columbia River, Washington, 1962, by Paul D. Zimmer and John H. Broughton, 29 pp., illus., August 1964.

SSR-Fish. No. 468 - Statistical Records and Computations on Red Salmon (*Oncorhynchus nerka*) Runs in the Nushagak District, Bristol Bay, Alaska, 1946-59, by Ole A. Mathisen, Robert L. Burgner, and Ted S. Y. Koo, 34 pp., illus., June 1963.

SSR-Fish. No. 479 - Age and Size Composition of the 1960 Menhaden Catch Along the U. S. Atlantic Coast, with a Brief Review of the Commercial Fishery, by William R. Nicholson and Joseph R. Higham, Jr., 44 pp., illus., August 1964.

SSR-Fish. No. 484 - Field Techniques for Staining-Recapture Experiments with Commercial Shrimp, by T. J. Costello, 15 pp., illus., August 1964.

SSR-Fish. No. 485 - Disappearance of Dead Pink Salmon Eggs and Larvae from Sashin Creek, Baranof Island, Alaska, by William J. McNeil, Ralph A. Wells, and David C. Brickell, 15 pp., illus., August 1964.

Annual Report of the Bureau of Commercial Fisheries Technological Laboratory, Seattle, Washington, Calendar Year 1962, by Patricia S. Terao, Circular 180, 15 pp., illus., September 1964. The Technological Laboratory of the Pacific Region, Bureau of Commercial Fisheries, one of six such laboratories, began its research activities on May 2, 1933. The laboratory carries out research on the preservation and utilization of fish and shellfish, the chemical properties of constituents, and the application of research findings to new and improved fishery products. By preparing technical bulletins and answering inquiries, the laboratory also provides the fishing industry and the general public with information on fishery products. Currently three major research programs are under way. The first program aims at widening markets for fish oils, and consists of organic chemical investigations of the properties and reactions of fish oils, of their derivatives, and of industrial evaluation of potential uses for these products. The second, in cooperation with the Atomic Energy Commission, concerns the irradiation pasteurization of several species of fish as a means of extending the storage life of iced fish. The third deals with improving the quality of fresh and frozen fish by developing standards of quality. Studies under the latter program at present focus attention on grading methods for judging the quality of halibut as landed by fishing vessels. Several smaller projects include experiments on shellfish processing, investigation of species of fish not utilized, and studies on fish spoilage.

The Bureau of Commercial Fisheries Biological Laboratory, Oxford, Maryland; Programs and Perspectives, Circular 200, 52 pp., illus., October 1964. Shellfish research in the Middle Atlantic States was materially advanced in 1960 when the Bureau of Commercial Fisheries Biological Laboratory at Oxford, Md., was established on the eastern shore of Chesapeake Bay. Committed to increased understanding of shellfish biology, and with particular interest in factors influencing survival, growth, and reproduction of shellfish, the laboratory joined a group of state and university research units involved with comparable problems. This series of papers has been prepared by biologists concerned with the laboratory's activities. Included are: "A brief history of Federal shellfish investigations in Chesapeake Bay," by James B. Engle; "The Bureau of Commercial Fisheries Biological Laboratory at Oxford, present and future," by Carl J. Sindermann; "Environmental features of the laboratory site; the Tred Avon River," by Robert W. Hanks; "Natural and artificial pond culture of oysters," by William N. Shaw; "Studies of oyster microparasites," by Aaron Rosenfield; and "Progress in surf clam biological research," by Arthur S. Merrill and John R. Webster.

The Commercial Fisheries of the Gulf and South Atlantic Region and Their Needs, Circular 181, 42 pp., illus., September 1964. Discusses in detail the status of the commercial fishery resources of the Region, their utilization, and their needs. Summarizes the programs that should be continued or undertaken within the Region to strengthen the fishing industry and point the way to full utilization of the resources of the Gulf and South Atlantic waters. Many of the needs will be met by industry without assistance. Other needs will be met by cooperative industry-Government action; and still others, particularly in the field of biological research to provide the basis for resource management, must be met through Government efforts--both State and Federal. Coordination and integration of those separate activities are possible through the Gulf States Marine Fisheries Commission and the Atlantic States Marine Fisheries Commission, and their standing committees.

Fisheries of the World, by Sidney Shapiro, 17 pp., printed. (Reprinted from *Farmer's World*, *The Yearbook of Agriculture* 1964, U. S. Department of Agriculture, pp. 161-177.) Some experts on marine resources believe that about 90 percent of the ocean's productivity is unused and that utilization eventually can be increased at least fivefold without endangering aquatic stocks, according to the report. The global catch was 20 million metric tons in 1950 and nearly 45 million in 1962. It may reach 70 million by 1980. The report discusses types of fisheries, methods of capture, utilization of the world's catches, international trade in fishery products, United States participation in 9 international fisheries conventions, United States aid programs to foreign fisheries, oceanographic research, and the First Law of the Sea Conference in Geneva in 1958.

Improving the Quality of Whiting, by John A. Peters, Edward H. Cohen, and Enrico E. Aliberte, Circular 175, 17 pp., illus., July 1964. In any food industry, quality is a large factor in price; and price is important in profits. At present, the whiting industry is in an unfavorable economic position. This report suggests how the industry can strengthen itself by

improving handling methods both on the vessel and at the shore plant. These changes will increase not only the efficiency of operations, but also the quality of the products.

Investigations in Fish Control: 1--Laboratories and Methods for Screening Fish-Control Chemicals; 2--Preliminary Observations on the Toxicity of Antimycin A to Fish and Other Aquatic Animals, by Robert E. Lennon, Charles R. Walker, and Bernard L. Berger, Circular 185, 40 pp., illus., June 1964.

Pesticide-Wildlife Studies, 1963: A Review of Fish and Wildlife Service Investigations during the Calendar Year, Circular 199, 130 pp., September 1964.

Selected List of Fish and Wildlife Publications for Conservation Education, 5 pp. These publications are available without charge, in limited quantities, to teachers for classroom use.

Sharks of the Genus CARCHARHINUS Associated with the Tuna Fishery in the Eastern Tropical Pacific Ocean, by Susumu Kato, Circular 172, 25 pp., illus., June 1964.

"Technological investigations of pond-reared fish. Part 1--Product development from buffalofish," by Leo J. Sullivan and Harry L. Seagran, article, Fishery Industrial Research, vol. 2, no. 2, December 1963, pp. 29-42, printed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U.S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL- 3 -	Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964, 38 pp.
MNL-63 -	United Arab Republic Fisheries, 1963 and 1964, 6 pp.
MNL-80 -	Brazil's Fishing Industry, 1963, 14 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE ICHTHYOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FISH AND WILDLIFE SERVICE, U.S. NATIONAL MUSEUM, WASHINGTON, D.C. 20560.

Families of Fishes New to the Antarctic. Communiqué 3--Pelagic Young of Flatfish (Pisces, Bothidae) Off the Antarctic Coast, by A. P. Anriashvili, Translation 21, 7 pp., processed. (Translated from the Russian, Zoologicheskij Zhurnal, vol. 39, no. 7, 1960, pp. 1056-1061.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE MARINE MAMMAL BIOLOGICAL LABORATORY, U.S. FISH AND WILDLIFE SERVICE, SAND POINT NAVAL AIR STATION, SEATTLE, WASH.

Present Status and Problems in Systematics of Pinnipeds, by K. K. Chapsky, 31 pp., processed. (Translated from the Russian, Trudy Sovetskoi Ikhtologicheskoi Komissii, Akademii Nauk SSSR, vol. 12, 1961, pp. 138-149.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE REGIONAL OFFICE, U.S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

Tuna Fishing Charts. Part I-II--April 1961-September 1961, October 1961-March 1962, 2 vols., illus., processed, 1963. (Translated from the Japanese, Tuna Fishing, no. 2 (86), July 1962.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, July and August 1964, 8 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, September 1964, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

Fishery and Oceanography Translations, No. 2, October 1964, 80 pp., processed. (Translation Program, Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. E., Seattle, Wash. 98102.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, September 1964, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

List of 102 Program Reports, Publications, and Proposals for Oceanographic Instrumentation (Including 74 ICO's PIEF Reports and Papers), by Julius Rockwell Jr., 12 pp., processed, February 18, 1964. (Oceanographic Instrumentation Program, Biological Laboratory, U. S. Bureau of Commercial Fisheries, Washington, D. C. 20240.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, October 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, September 1964, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fish-

ery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown). Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary-- August 1964, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October 1964, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl receipts reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Fishery Statistics of the United States, 1962, by E. A. Power and C. H. Lyles, Statistical Digest 56, 468 pp., illus., printed, 1964, \$2.25. The latest in a series of annual statistical reports on the fisheries of the United States contains data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fish and shellfish, and information on the volume and value of the production of manufactured fishery products and by-products. The 1962 commercial fisheries of the United States yielded a record catch of 5.4 billion pounds valued at \$396 million ex-vessel. The volume of the catch was 86 million pounds above the previous high set in 1956, while the value was \$23 million greater than the \$373 million received in 1958. The average price paid ex-vessel in 1960 was 7.4 cents per pound. Large catches of menhaden, herring, and miscellaneous industrial fish kept the average price per pound relatively low despite an increase in the price paid for most items. Species

taken in record volume in 1962 were bluefin tuna, menhaden, blue crab, king crab, surf clam, and yellowtail flounder. The combined United States-Canadian catch of 75.1 million pounds of Pacific halibut (landed weight) was also a new record. Continuing a trend which began in 1960, the number of fishing vessels again declined. The 1962 catch was taken by 126,333 fishermen. Louisiana again led all other states in volume with 777 million pounds, accounting for almost 15 percent of the total 1962 United States landings. Alaska again led all other states in value with \$57 million--a little more than 14 percent of the United States total. San Pedro, Calif., was the leading fishing port in 1962 with respect to both volume and value of landings--362 million pounds with an ex-vessel value of \$36 million. For the third time, the catch taken for industrial products (2.81 billion pounds) exceeded the quantity taken for human food (2.54 billion pounds). The per capita consumption of fish and shellfish in the U. S. in 1962 was 10.7 pounds (edible weight)--0.1 pound less than in 1961. Reduced landings of ocean perch and pollock were chiefly responsible for declining landings in the groundfish industry. The 124 million pounds of ocean perch taken were the lowest since 1944 and less than half the record 258 million pounds taken in 1951. The Maine sea herring fishery made a remarkable recovery in 1962; the catch was up over 100 million pounds. The southern California Pacific and jack mackerel fishery landed 139 million pounds. The record 2.3 billion pounds of menhaden taken in 1962 was 33 million pounds greater than in 1961, and the largest annual catch of a single species ever landed in the United States. Landings of Pacific salmon were 314.6 million pounds worth a record \$56.4 million ex-vessel, up 4 million pounds and \$4 million from 1961. Only 15.4 million pounds of California sardines were landed, and with the exception of 1952 and 1953, the catch was the smallest since World War I. Landings of tuna were 312.1 million pounds worth \$45.1 million, a decline of 13.6 million pounds but an increase of \$2.8 million compared with 1961. The crab catch was 234 million pounds worth nearly \$19 million--a record in both volume and value. Landings of oysters were the lowest on record, only 56 million pounds--6.3 million less than the previous year. The production of shrimp products continued to increase in 1962, yielding processors a record \$161 million. The 1962 pack of canned fishery products by 373 plants in the United States, American Samoa, and Puerto Rico was 36.8 million standard cases (1.1 billion pounds worth \$456.9 million to the packers). The production of industrial fishery products by 158 plants was worth \$75.7 million--an increase of \$1.1 million over 1961. Production of fresh and frozen packaged fish fillets and steaks totaled 171.5 million pounds worth \$59.3 million to the processors. Fish stick production reached a record 72.2 million pounds, and portions also a record 78.7 million pounds. The 1962 production of frozen fish and shellfish was 343 million pounds--24 million pounds more than in 1961. U. S. foreign trade in fishery products (imports plus exports of domestic products) was valued at a record \$511 million--\$79 million more than in the previous year.

Propagation and Distribution of Food Fishes for the Calendar Years 1961 and 1962, Statistical Digest 55, 49 pp., September 1964, 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ARCTIC CHAR:

"Sapotit--home of the Arctic char," article, Trade News, vol. 17, no. 3, September 1964, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Depicts with photos the Eskimo summer fishery for Arctic char. They build up walls of rock across the river narrows, arranged in a manner that will lead the big, sleek Arctic char into a closed area of shallow water. Each summer the Eskimos must rebuild their stone weirs, which have been wrecked by the ice during the winter and spring, and when the walls are finished a watch is kept. When the char move upriver and into the traps the hunters, with wives and children beside them in the waist-deep water, spear the fish. The catch is stored to provide winter food for the Eskimo families and their dogs. In some regions commercial fisheries have been established during the past few years.

ARGENTINA:

"Las posibilidades de los subproductos en la Argentina" (The potential for fishery byproducts in Argentina), article, Puntal, vol. 11, no. 126, September 1964, pp. 2-3, 5, illus., printed in Spanish. Puntal Apartado de Correos 316, Alicante, Spain.

AUSTRALIA:

Fishing and Whaling, Australia, 1962-63, Statistical Bulletin No. 9, 24 pp., illus., processed, April 16, 1964. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the ninth of a series of annual statistical bulletins dealing with the fishing and whaling industry. Statistics relate to the year 1962-63 for general fisheries, the 1962 season for pearl-shell and trochus-shell fisheries, and the 1963 season for whaling, with comparative data for the previous four years. Exports and imports of fishery products, unmanufactured shells, and marine animal oils are shown for 1962-63 together with comparable figures for the previous two years. The bulletin is divided into four parts. Part I deals with general fisheries including those for fish, crustaceans, and molluscs (edible products). Part II includes fisheries for pearl shell and trochus shell (inedible products). Part III covers the operations of the whaling industry in Australia and Norfolk Island. Part IV shows particulars of oversea trade in the products of fishing and whaling.

Native Freshwater Fishes of Australia, by Gilbert P. Whitley, 127 pp., illus., printed, 1964, 14s. 6d. (about US\$2.05). Jacaranda Press, Brisbane, Australia.

AUSTRALIAN SALMON:

Australian Salmon, by W. B. Malcolm, Reprint 535, 4 pp., processed. (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

BACTERIOLOGY:

"A study of the microbiological quality of haddock fillets and shucked, soft-shelled clams processed and marketed in the Greater Boston area," by J. T. R.

Nickerson and S. A. Goldblith, article, Journal of Milk and Food Technology, vol. 27, January 1964, pp. 7-12, printed. International Association of Milk and Food Sanitation, Box 437, Shelbyville, Ind.

BALTIC SEA:

Yield of Baltic Catches in 1953-1954 as Compared with Previous Years (Wydażność Polowow Bałtyckich w Latach 1953-1954 na tle lat Ubiegłych), by Stanisław Laxczynski, OTS 61-11363, 35 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, Prace Morskiego Instytutu Rybackiego w Gdyni, vol. 9, 1957, pp. 705-738.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

BELGIUM:

"L'entrepôt frigorifique maritime de Zeebrugge (Belgique)" (The marine cold store at Zeebrugge (Belgium)), by P. Jauniaux, article, Revue Generale du Froid, vol. 41, no. 2, February 1964, pp. 117-119, illus., printed in French. Association Francaise du Froid, 29 Blvd. Saint-Germain, Paris (6^e), France.

BIOCHEMISTRY:

"Studies on the external mucous substance of fishes. VII--Quantitative analysis of the mucous-polysaccharide from some fishes. 1--Neutral sugar composition," by Noriyuki Enomoto and Yukio Tomiyasu, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, May 1962, pp. 510-513, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan.

"Volatile alkaline matter and trimethylamine in meat of various fishes caught in Azov-Black Sea basin," by G. K. Koval'chuk and N. F. Moskalenko, article, Rybnoe Khoziaistvo, vol. 37, no. 12, 1961, pp. 64-68, printed in Russian. Rybnoe Khoziaistvo, V. Krasnoel'skaia 17, B-140, Moscow, U.S.S.R.

BRAZIL:

"Classificacao economica dos peixes do Rio Grande do Sul" (Economic classification of fishes of Rio Grande do Sul), by B. N. Barcellos, article, Boletim Instituto Ciencia Natural da Universidade do Rio Grande do Sul, vol. 14, 1962, pp. 5-16, printed in Portuguese. Instituto Ciencia Natural, Universidade do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil.

"Nomes comuns dos peixes da costa do Rio Grande do Sul e seus correspondentes em sistematica" (Common names of fishes of the coast of Rio Grande do Sul, and their corresponding names in systematics), by B. N. Barcellos, article, Boletim Instituto Ciencia Natural da Universidade do Rio Grande do Sul, vol. 15, 1962, pp. 7-20, printed in Portuguese.

BRITISH VIRGIN ISLANDS:

Basic Data on the Economy of the British Virgin Islands, by Lawrence J. Comella, OBR 64-110, 8 pp., illus., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) These 32 islands with a land area of 58 square miles are situated about 60 miles east of Puerto Rico and about 140 miles northwest of St. Kitts. The report discusses geography, population, and government; structure of the economy--agriculture, fishing, forestry, tourism, transportation, communications, utilities, labor, housing, currency, and development programs; and foreign trade,

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including customs tariff. Included are statistical tables on foreign trade, 1958-61; imports by principal suppliers, 1961; and imports of principal commodities, 1961.

CALIFORNIA:

California Fish and Game, vol. 50, no. 4, October 1964, 95 pp., illus., printed, single copy 75 cents. Documents Section, P.O. Box 1612, Sacramento, Calif. 95807. Includes, among others, articles on: "Age and length composition of the sardine catch off the Pacific Coast of the United States and Mexico in 1961-62," by Anita E. Daugherty and Robert S. Wolf; and "Report on a recent shark attack off San Francisco, California," by Ralph S. Collier.

CANADA:

Journal of the Fisheries Research Board of Canada, vol. 21, no. 3, May 1964, 232 pp., illus., printed, single copy C\$2. Queen's Printer, Ottawa, Canada. Includes, among others, articles on: "Seasonal distribution of cod (*Gadus morhua* L.) along the Canadian Atlantic coast in relation to water temperature," by Yves Jean; "Cod roe: component fatty acids as determined by gas-liquid chromatography," by R. G. Ackman and R. D. Burgher; "Tributary homing of sockeye salmon at Brooks and Karluk Lakes, Alaska," by Wilbur L. Hartman and Robert F. Raleigh; "The primary production of a British Columbia fjord," by Malvern Gilmartin; "Polyphosphate treatment of frozen cod. 2--Effect on drip, yield, lipid hydrolysis and protein extractability in twice-frozen Newfoundland summer trap and fall cod," by W. A. MacCallum and others; "Incidence of *Ligula intestinalis* in Heming Lake fish," by G. H. Lawler; "Cooking method and palatability of frozen cod filets of various qualities," by W. J. Dyer; "Fecundity of the American plaice, *Hippoglossoides platessoides* (Fabr.) from Grand Bank and Newfoundland areas," by T. K. Pitt; "Net avoidance behavior of carp and other species of fish," by John R. Hunter and Warren J. Wisby; "A vacuum-assisted subsampler for use with small planktonic organisms," by Robert A. McHardy; "Further evidence of hardness of 'silver' pike," by G. H. Lawler; "Utilization of lipids by fish. III--Fatty acid oxidation by various tissues from sockeye salmon (*Oncorhynchus nerka*)," by R. E. E. Jonas and E. Bilinski; and "An unusually late-spawning British Columbia chum salmon," by W. Percy Wickett.

CANNING:

Revolutionary Canning Process, by Howard P. Milleville, 8 pp., illus., printed. (Reprinted from Food Processing, March 1964.) Swift & Company, Grocery Division, 115 W. Jackson Blvd., Chicago, Ill. 60604. Discusses a continuous processing production unit now in operation in a Missouri plant that eliminates retorting required in the conventional canning of foods. The retort is a pressurized chamber where, in the conventional canning process, steam heats the sealed cans of food to sterilizing temperature. In the new process, the filling operation is conducted in a pressurized chamber or room so that the foods are at sterilizing temperatures when filled and sealed into the cans. Flavor of the products is excellent and shelf life is reported as being surprisingly good. A letter from the patentee states: "Up to the present time research and prod-

uct development activity has been concentrated in the area of canned meat products. We feel that the process can well have benefits when applied to the canning of fish but no research has been done in this direction and none is currently scheduled."

CARP:

"Carp control gets results," by Barney Wanie, article, Wisconsin Conservation Bulletin, vol. 28, no. 6, 1963, pp. 22-23, illus., printed, Wisconsin Conservation Department, Box 450, Madison 1, Wis.

CATFISH:

"The channel cat," by Alan H. Finke, article, Wisconsin Conservation Bulletin, vol. 29, no. 2, 1964, pp. 18-19, illus., printed.

CEYLON:

Foreign Trade Regulations of Ceylon, by Jackson B. Hearn, OBR 64-116, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Ceylon's trade policy is designed to adjust imports to the country's economic needs within the limits of available foreign exchange resources. In addition to trade policy, the report discusses import tariff system, documentation, and labeling and marketing requirements. Also covers special customs provisions, nontariff import controls, Ceylon's export controls, United States foreign trade controls, and Government representation between Ceylon and the United States.

CHEMICAL CONTENT:

"Determination of Zirconium 95 and Niobium 95 in seaweed and sea water," by B. L. Hampson, article, Analyst, vol. 88, July 1963, pp. 529-533, printed. Analyst, W. Heffer & Son, Ltd., Cambridge, England.

CHESAPEAKE BAY:

Chesapeake Science, vol. 5, no. 3, September 1964, 51 pp., illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Includes, among others, these articles: "Length increment during terminal molt of the female crab, *Callinectes sapidus*, in different salinity environments," by Paul A. Haefner, Jr. and Carl N. Shuster, Jr.; "Fish distribution at varying salinities in Neuse River Basin, North Carolina," by Lewell Keup and Jack Bayless; "Uptake and retention of Rhodamine B by Quahog clams, *Merccenaria mercenaria*," by J. R. Geckler and T. A. Wandstrat; "Morphometry of the common Atlantic squid, *Loligo pealei*, and the brief squid, *Lolliguncula brevis*, in Delaware Bay," by Paul A. Haefner, Jr.; and "Growth compensation in four year classes of striped bass, *Morone saxatilis*, from Albemarle Sound, North Carolina," by William R. Nicholson.

CLAMS:

Dried Unicellular Algae as Food for Larvae of the Hard Shell Clam, *MERCENARIA MERCENARIA*, by Herbert Hidu and Ravenna Ukeles, 17 pp., illus., processed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 53, 1962, pp. 85-101.) National Shellfisheries Association, Virginia Institute of Marine Science, Gloucester Point, Va.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

COD:

"Cooking method and palatability of frozen cod fillets of various qualities," by W. J. Dyer and others, article, Journal of the Fisheries Research Board of Canada, vol. 21, 1964, pp. 577-589, printed. Queen's Printer, Ottawa, Canada.

1950-1954 Distribution of Spawning Shoals of Cod in Bornholm Basin in the Light of Varying Environmental Factors (Rozmieszczenie Lawic Rozrodczych Dorsza w Basenie Bornholmskim w Latach 1950-1954 w Swietle Zmiennych Czynnkow Srodowiska), by Jan Elwertowski, OTS 61-11359, 14 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, Prace Morskiego Instytutu Rybackiego w Gdyni, vol. 10/A, 1959, pp. 361-374.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

COLD STORAGE:

Progres dans la Science et la Technique du Froid--Comptes Rendus du XI^e Congres International du Froid, Munich (Allemagne), 1963 (Progress in Refrigeration Science and Technique, Report of the 11th International Congress of Refrigeration, Munich, Germany, 1963), 3 Vols., printed in French and English, 1964, \$40. International Institute of Refrigeration, 177, Blvd. Malesherbes, Paris (17^e), France. Volume II discusses problems of refrigeration of fish. It also contains a section on Commission 6 c, pertaining to theory and industrial development of freeze-drying, and its medical and biological application.

CONTAINERS:

"El envase de aluminio para conservas de pescado" (The aluminum container for canned fish), article, Informacion Conservera, vol. 12, no. 127, July 1964, pp. 278, 279, printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Informacion Conservera, Colon, 62, Valencia, Spain.

"Solubility of tin in canned marine foods on the market," by Chong Hun Won, article, Chemical Abstracts, vol. 58, April 15, 1963, 8356a, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

CRABS:

Reprint from Transactions of the American Fisheries Society, vol. 93, no. 3, July 1964. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005: Fishing Mortality and Movements of Adult Male King Crabs, PARALITHODES CAMTSCHATICA (Tilesius), Released Seaward from Kodiak Island, Alaska, by Guy C. Powell, 6 pp. (pp. 295-300), illus., printed.

Tag Loss during Ecdysis by the King Crab, PARALITHODES CAMTSCHATICA (Tilesius), by George W. Gray, Jr., 2 pp. (pp. 303-304), printed.

"Relative abundance of edible crabs of family Portunidae in Karachi offshore waters," by Syed Salah-ud-Din Hashmi, article, Pakistan Journal of Science, vol. 15, no. 3, 1963, pp. 115-119, printed. Pakistan Association for the Advancement of Science, Lahore, Pakistan.

CRUSTACEANS:

Serial Atlas of the Marine Environment--Euphausiids and Pelagic Amphipods, Distribution in North Atlantic and Arctic Waters, by Maxwell J. Dunbar, Folio 6, 10 pp., illus., printed, 1964, \$7. Serial Atlas of the Marine Environment, American Geographical Society, Broadway at 156th St., New York, N. Y. 10032. This folio presents the North Atlantic and Arctic distribution of 8 species of pelagic crustacea, northward from the Labrador coast and the British Isles. Essentially a study of the northern limits of the southern forms, and the southern limits of the northern forms. Anomalies in distribution, in terms of Arctic, Subarctic, and Atlantic water masses are brought out, and the relevance of pelagic distribution studies to water mass, food supply, and ecosystem complexity is discussed briefly. The 8 species mapped are Meganyctiphanes norvegica (M. Sars), Thysanoessa longicaudata (Krøyer), T. inermis (Krøyer), T. raschii (M. Sars), Parathemisto gaudichaudi (Guerin), P. abyssorum (Boeck), P. libellula (Mandt), and Gammarus wilkitzkii Birula. This study forms Folio 6 of the Serial Atlas, which is being issued as a series of separate folios, each a complete study in itself of a physical, biological, chemical, or geological aspect of the ocean.

DENMARK:

Fiskeriberetning for Aret 1963 (The Ministry of Fisheries Annual Report for 1963), 136 pp., illus., printed in Danish with English summary, Kr. 7.50 (about US\$1.10). Fiskeriministeriet, 1 Kommission Hos, G. E. C. Gad, Copenhagen, Denmark. Includes information and statistical tables on number of fishermen employed, fishing vessels and gear, and landings of fish and shellfish. Also contains information on trout farms; production of canned, filleted, and smoked fish; and foreign trade in fishery products; organization of Fisheries Ministry; and legislation pertaining to fisheries.

DOGFISH:

"Long journey of the dogfish," by Walter N. Hess, article, Natural History, vol. 73, no. 9, November 1964, pp. 32-35, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park W. at 79th St., New York, N. Y. 10024. Discusses the life history and annual migrations of the dogfish, Squalus acanthias, from the Virginia-Carolina coastal waters to Labrador. One of the great mysteries about the migration and feeding activities of these small sharks is how they keep together in packs, since the sea is so spacious and is relatively dark at the depths where they are usually found. Like their larger relatives, S. acanthias have an exceedingly keen sense of smell and a lateral line sense for detecting vibrations in water; these may help them stay together. Their round-trip of 2,500 miles a year, or ten miles a day, is certainly a most exceptional feat of migration.

DOLPHIN:

Commercial Utilization of Dolphins (Porpoises) in Ceylon, by A. W. Lantz and C. Gunasekera, Bulletin No. 3, 14 pp., illus., printed, 1955. Department of Fisheries, Colombo, Ceylon. Describes in detail the commercial possibilities in the capture and utilization of two species of dolphins abundant in waters adjacent to Ceylon. Outlines the method of capture and use of

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dolphin meat for human consumption, together with recipes for cooking. The possibility of using dolphin skin as a fine leather is also discussed, and the process for tanning the skin is explained. In conclusion the authors state that "Fresh dolphin meat when placed on the market sold readily despite some local prejudice against the naturally dark-coloured meat. The flesh of the dolphin is nutritious and can be used successfully in both western and eastern types of cookery. An effort should be made to popularize the dolphin flesh as a high quality protein food. The price should be reasonable so that low-income groups may benefit from its use and nutritional properties." The authors add that "The skin of the dolphin can be tanned to yield at least two kinds of excellent quality leather. The blubber layer which lies immediately under the skin can be rendered into commercially valuable oil. Unused portions such as parts of the head, the bones, viscera and flesh trimmings can be processed into meal for additions to animal feeds or for soil fertilization. The process of manufacture is similar to that used for production of fish meals."

Morphological Basis for the Ultrasonic and Sonic Detection Characteristics of the Dolphin, by V. P. Zvorykin, OTS 63-31738, 15 pp., processed, September 11, 1963, 50 cents. (Translated from the Russian, *Arkhiv Anatomi, Gistologii i Embriologii*, no. 7, 1963, pp. 3-17.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

The Secrets of the Dolphin, by Helen Kay, 120 pp., illus., printed, 1964, \$3. The MacMillan Co., 60 Fifth Ave., New York, N. Y. 10011. The most playful yet intelligent mammal--the dolphin or porpoise--is the main character in this book. Jacques-Yves Cousteau says: "The brain of a porpoise is the same weight and size in comparison to its body as man's." This is no fiction story, but a true story. Careful research and the use of many sources has resulted in a true but delightful popular description of this mammal. Anecdotes, history, legend, and scientific facts are blended together into a panoramic picture of the dolphins. Today dolphins are top attractions for sightseers visiting at the many marine aquariums found in the United States and other parts of the world. Scientists also are delving into the dolphin's ability to understand and to learn quickly. Human personalities are almost imparted to the particular dolphins the author describes in Part I, which is titled "Dolphins are Delightful!" The second part is devoted to the legends and lore surrounding the dolphin. In the part on legends, one chapter is titled: "Were the Dolphin Riders Legend?"; and the other chapters deal with the dark ages of the dolphin; "Pilot Jack;" and "You Can Swim Like a Dolphin." In Part III, dealing with the secrets of the dolphin, are found chapters on the porpoises and sonar; porpoise watching; how the dolphins hear without an ear; "This Man Talks to Dolphins;" and the porpoises of Point Mugu. Included is an appendix, "What's in a Name?"; a small but interesting bibliography; and an adequate index for quickly locating some of the many bits of information the book contains. Written for the young reader, it still makes fascinating reading for any adult young at heart or for reading out loud to a group of children.

-- Joseph Pileggi

ECUADOR:

Apuntes e Informaciones sobre las Pesquerias en las Provincias del Guayas y los Rios (Memoranda and Information on the Fisheries in the Provinces of Guayas and los Rios), *Boletin Informativo*, vol. 1, no. 4, 85 pp., illus., printed in Spanish, 1964. Instituto Nacional de Pesca del Ecuador (Biblioteca), Casilla 5918, Guayaquil, Ecuador.

EUROPEAN FREE TRADE ASSOCIATION:

Fourth Annual Report of the European Free Trade Association, 1963/1964, 30 pp., printed, Sept. 1964, \$1. European Free Trade Association, 711 14th St. NW., Washington, D. C. 20005.

FACTORYSHIP:

"On board the Constanta," by E. B. Slack, article, *World Fishing*, vol. 13, June 1964, pp. 63-64, 67-68, printed. John Trundell and Partners Ltd., St. Richard's House, Eversholt St., London NW1, England. Discusses the 10-day visit of the author on board the Rumanian factory trawler Constanta to meet its staff and share their working and off-duty experiences on board the vessel. Of the capital investment in the vessel, about \$1 million is in the form of elaborate scientific and technological equipment. She is the largest factory trawler yet in operation, and pulls the largest trawl net ever designed. Estimates place her catching performance at about 80 tons in 24 hours. The largest single haul was made in one trawling period of about 2 hours and was estimated to be about 15-20 tons. The trials, conducted off New Zealand, were considered to be highly successful and the vessel will operate in the future in North Atlantic waters.

FAT:

"Results of recent investigations on fats of sea- and fresh-water animals," by T. H. Khoe, article, *Chemical Abstracts*, vol. 59, August 19, 1964, 4301c, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

FATTY ACIDS:

"Positional distribution of fatty acids in fish and other animal lecithins," by Daniel B. Menzel and H. S. Olcott, article, *Biochimica et Biophysica Acta*, vol. 84, April 20, 1964, pp. 133-139, printed. Elsevier Publishing Co., P. O. Box 211, Amsterdam, Netherlands.

FEEDING:

Feeding and Food Relationships of Fishes in the Piedmont Tributaries of the Lower Amur River (Pitanie i Pishchevye Otnosheniya Ryb v Predgornnykh Pritokakh Nizhnego Tcheniya Amura), by V. Ya. Levandov, OTS 63-11104, 18 pp., processed, 1964, 50 cents. (Translated from the Russian, *Voprosy Ikhtologii*, No. 13, 1959, pp. 139-155.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Method of Estimating the Production of Organisms

Serving as Food for Fishes (K Metodike Opredeleya Produktsii Kormovykh Dlya Ryb Zhivotnykh), by A. S. Konstantinov, OTS 63-1115, 5 pp., processed, 1964, 50 cents. (Translated from the Russian, *Nauchnye Doklady Vysshei Shkoly, Biologicheskie Nauki*, no. 4, 1960, pp. 59-62.)

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"Filleting Fish," Patent No. 928, 733, article, Food Manufacture, vol. 39, March 1964, p. 87, printed. Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

FISH BEHAVIOR:

Methods of Studying the Schooling Behavior of Fishes (O Metodakh Izucheniya Stainogo Povedeniya Ryb), by Yu. E. Milanovskii and V. A. Rekubratskii, OTS 63-11116, 6 pp., processed, 1964, 50 cents. (Translated from the Russian, Nauchnye Doklady Vysshei Shkoly, Biologicheskie Nauki, no. 4, 1960, pp. 77-81.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Orientation of Fishes, by Arthur D. Hasler, Final Report for 1 Sep 57-30 Aug 63, 16 pp., printed, May 1963. University of Wisconsin, Madison, Wis.

The Role of the Sun's Altitude in Sun Orientation of Fish, by Horst O. Schwassmann and Arthur D. Hasler, 16 pp., printed, April 1964. (Reprinted from Psychological Zoology, vol. 37, no. 2, April 1964, pp. 163-177.) Laboratory of Limnology, University of Wisconsin, Madison, Wis.

Use of Mechanical Devices in Studying the Distribution and Behavior of Commercial Fishes (Opyt Primeneniya Tekhnicheskikh Sredstv Izucheniya Raspredeleniya i Povedeniya Promyslovnykh Ryb), by O. N. Kiselev, OTS 63-11114, 4 pp., processed, 1964, 50 cents. (Translated from the Russian, Trudy Soveshchaniy Ikhtologicheskoi Komissii Akademii Nauk SSSR, no. 10, 1960, pp. 235-238.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

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Frozen King Crab, 25 cards, illus., printed. Wakefield's Deep Sea Trawlers, Inc., Fishermen's Terminal, Seattle 99, Wash. A set of 25 3¼-inch by 5½-inch cards containing recipes for preparing king crab, with color-illustrated dividers. Sections include product information; and recipes for salads, king crab legs, and hot dishes. Some of the recipes include crab louis, crab leg appetizer with Mediterranean sauce, crab meat Caribbean, crab imperial, and crab meat Newburg.

FISH FOOD:

"Pelleted fish food," article, Feedstuffs, vol. 36, July 11, 1964, p. 16b, printed. Feedstuffs, P. O. Box 67, Minneapolis, Minn. 55440.

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Licence Limitation as a Means of Controlling Fishing Effort, by G. L. Kesteven and G. R. Williams, Reprint 536, 14 pp., illus., processed. (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

FISHING WITH LIGHTS:

"Peche au feu" (Fishing with lights), by J. P. Gapihan, article, France Peche, no. 88, October 1964, pp. 40-41, illus., printed in French, single copy 2.5 F (about 50 U. S. cents). France Peche, Boite Postale 179, Lorient, France.

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Contribucion al Estudio Fisicoquimico de los Aceites de Higado de Pescado (Contribution to the Physical-Chemical Study of Fish-Liver Oils), by Manuel Calvo Mendoza, 48 pp., illus., printed in Spanish, 1962. Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

"Effect of sunlight and air on cod-liver oil," by Stanislaw Byczkowski and Wanda Kiewlicz, article, Chemical Abstracts, vol. 58, April 15, 1963, 8152c, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

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"Oxidizing deterioration of medicinal fish oils," by V. G. Parteshko, article, Chemical Abstracts, vol. 60, April 27, 1964, 10479d, printed.

"Partial characterization of the hydrocarbons of her-ring oil," by Georg Lambertsen and Ralph T. Holman, article, Chemical Abstracts, vol. 58, June 10, 1963, 12778a, printed.

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First Results of the Operation of the Fish Pass at the Volga Hydroelectric Station Named "XXII Congress of the KPSS", by L. M. Nusenbaum, 4 pp., processed, 1963. (Translated from the Russian, Rybnoe Khoz-iaistvo, vol. 37, no. 11, 1961, pp. 13-18.) Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., Canada.

FISH PROTEIN CONCENTRATE:

"Odorless fish flour," by Yohei Hashimoto and Kazuo Miura, article, Chemical Abstracts, vol. 60, March 2, 1964, 6144b, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

"Some aspects of the technology of fish flour," by M. N. Moorjani and N. L. Lahiry, article, Review of Food Science and Technology, vol. 4, 1962, pp. T13-136, printed. Central Food Technological Research Institute, Mysore, India.

FISH SAUCE:

"Study on the production of fish sauce. I--Effect of commercial proteolytic enzymes on the production of fish sauce," by S. Murayama, D. L. Calvez, and P. Nitayachin, article, Bulletin, Tokai Regional Fisheries Research Laboratory, no. 32, 1963, pp. 155-162, printed in Japanese. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

FISH SPOTTING:

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of helicopters), by M. Yves Bourdreault, article, Puntal, vol. 11, no. 125, August 1964, pp. 2-3, 5, 7, illus., printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

FOOD AND AGRICULTURE ORGANIZATION:

FAO--Its Organization and Work and United States Participation, by Ralph W. Phillips, FAS-M-93-Revised, 30 pp., illus., processed, August 1964. Foreign Agricultural Service, Rm. 5918, U. S. Department of Agriculture, Washington, D.C. 20250. This publication is designed to provide information on the manner in which the Food and Agriculture Organization (FAO) was established, how it has developed during its first two decades, and ways in which the United States participates. Also, it provides background on membership, governing bodies, organizational structure, and programs.

Informe Provisional de la IIa Reunion de "C.A.R.P.A.S." Celebrada en Mar del Plata (Argentina) del 27 al 30 de Abril de 1964. (Provisional Report on the Second Meeting of C.A.R.P.A.S. Held in Mar del Plata, Argentina, April 27-30, 1964), 23 pp., processed in Spanish, distribution limited. Comision Asesora Regional de Pesca para el Atlantico Sudoccidental, Rua do Jardim Botânico No. 1008, Rio de Janeiro, Brazil. C.A.R.P.A.S. is the Regional Fisheries Advisory Commission for the Southeast Atlantic.

Proceedings 10th Session, Seoul, Korea, 1962. Section II--Technical Papers, 330 pp., printed, 1963. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Second Report to the Government of the United Arab Republic on Fishery Investigations on the Nile River, the Lakes and the Pond Farms in Egypt, by Wilhelm F. J. Wunder, ETAP Report No. 1640, 25 pp., illus., processed, 1963.

Fourth Report to the Government of India on Fishing Boats, by Albert Sutherland, ETAP Report No. 1710, 46 pp., illus., processed, 1963.

Report to the Government of Rhodesia and Nyasaland on the Fisheries Development Program for Lake Tanganyika, by Alphonse Collart, ETAP Report No. 1716, processed.

Report on the Regional Training Center on Fish Processing Technology Held at Quezon City, Philippines, by Rudolph Kreuzer, ETAP Report No. 1725, processed.

Report to the Government of El Salvador on Development of Inland Fisheries, by S. Y. Lin, ETAP Report No. 1735, 28 pp., illus., processed, 1963.

Informe al Gobierno de Chile sobre Cooperativas Pesqueras (Report to the Government of Chile on Fishery Cooperatives), by Paulino San Emeterio, ETAP Report No. 1764, processed.

Informe al Gobierno de Honduras sobre los Recursos de Camarones (Report to the Government of Honduras on the Shrimp Resources), by Harold Loesch, ETAP Report No. 1787, processed.

FOREIGN TRADE:

"Lending agencies help," by Ada Wrigley, article, International Commerce, vol. 70, no. 46, November 16, 1964, pp. 5-11, illus., printed, single copy 35 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Two United States agencies and several international institutions provide loans which help U. S. exporters and investors. Their purposes, resources, spheres of operation, and loan requirements vary considerably. This article and the accompanying chart provide an up-to-date summary of the purposes and character of these institutions insofar as their major lending operations are concerned. Discusses the Export-Import Bank, Agency for International Development, World Bank (comprising the International Bank for Reconstruction and Development, International Development Association, and the International Finance Corporation), and the Inter-American Bank.

FRANCE:

"La production de la pêche française en 1963" (The French fishery production in 1963), article, La Pêche Maritime, vol. 43, no. 1037, August 1964, pp. 579-585, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

FREEZE DRYING:

"Freeze-dried foods flavour ratings," article, Food Manufacture, vol. 39, May 1964, p. 68, printed, Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

"Rapid reconstitution of freeze-dried foods," by F. Fidler, article, Food Manufacture, vol. 39, June 1964, p. 55, printed.

"Suska ryby metodom sublimacii" (Freeze drying of fish), by A. K. Kaminarskaja, article, Kholodil'nika Tekhnika, no. 6, 1962, pp. 42-45, illus., printed in Russian. Four Continent Book Corp., 822 Broadway New York, N. Y. 10003.

FREEZER TRAWLER:

"All freezer trawler," article, Modern Refrigeration, vol. 66, no. 788, November 1963, pp. 1026-1029, printed. Refrigeration Press Ltd., Maclaren House, 131 Great Suffolk St., London SE1, England.

FREEZING ON BOARD:

"Nuevos métodos para congelar pescados en alta mar" (New Freezing processes for fish on the high seas), article, La Técnica del Frío, vol. 11, no. 105, July-August 1963, pp. 52-68, illus., printed in Spanish.

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Calveiro y Liberatore, 436 Rio Bamba, Buenos Aires, Argentina.

FRENCH GUIANA:

Basic Data on the Economy of French Guiana, by Walter Haidar, OBR 64-111, 8 pp., illus., printed, September 1964, 15 cents, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) French Guiana, an underpopulated and underdeveloped land of potential wealth, depends heavily on the French Government for financial and technical assistance. That government is fostering a policy of economic development; and public spending, mainly for the improvement of port facilities, roads, and utilities, was increased in 1963. The report discusses geography and climate, population and employment, and Government; national income; agriculture, forestry, and fishing; mineral resources; industry; transportation, communications, and utilities; public and private investments and sales potentials; development programs; financial situation; and foreign trade. The seas bordering Guiana abound in turtles, shellfish of all kinds, mullet, tuna, swordfish, and a great variety of shrimp.

FRESHNESS:

"Un nuovo apparecchio per la determinazione istantanea della freschezza del pesce: il Fish Tester V" (A new device for the instant determination of the freshness of fish: the Fish Tester V), article, La Pêche Maritime, vol. 43, 1964, p. 121, printed in French, Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

FRESH-WATER FISHERIES:

"Freshwater fisheries--problems and potential," by John S. Lake, article, Fisheries Newsletter, vol. 23, no. 9, September 1964, pp. 24-25, 27, illus., printed, Fisheries Branch, Department of Primary Industry, Canberra, Australia.

FROZEN FISH:

"Accent on frozen fish and seafood profits," by Robert J. Gruber, article, Quick Frozen Foods, vol. 26, April 1964, p. 49, printed, E. W. Williams Publications, Inc., 82 Wall St., New York, N. Y. 10005.

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"Le transport des poissons surgelés" (Transport of frozen fish), by R. Reynaud, article, Revue Generale du Froid, vol. 41, no. 1, January 1964, pp. 37-43, illus., printed in French.

Electrical Resistance Thawing of Fish, by H. R. Sanders, Torry Memoir No. 143, 5 pp., illus., printed, 1963. Torry Research Station, 135 Abbey Rd., Aberdeen, Scotland.

"Modern Danish view on the handling and distribution of frozen fish," by Mogens Jul, article, Food Technology, vol. 17, August 1963, pp. 46-48, printed, The Garrard Press, 510 N. Hickory, Champaign, Ill.

"Die sache mit dem aufgetauten frostfisch" (The problem of thawed frozen fish), by K. Bahr, article, Ties-kuhlkette, no. 90, June 1963, pp. 16-18, printed in German, H. E. Albrecht Verlag KG., Freihamerstrasse No. 2, Munich, Federal Republic of Germany.

GEAR:

Fishing Power Studies, by J. E. Paloheimo, Manuscript Report Series (Biological) No. 789, 2 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

"On working performance of net-hauling machines of different types," by R. T. Mikhailov, article, Rybnoe Khoziaistvo, vol. 38, no. 11, 1962, pp. 59-64, printed in Russian, Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

The following papers (in English with French and Spanish abstracts) were presented at the Second World Fishing Gear Congress, London, May 25-31, 1963:

Development of Electrical Shrimp Trawling Gear, by F. Wathne, 12 pp., illus., processed, U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Fla.

Double-Rig Shrimp Beam Trawling, by J. Verhoest and A. Maton, 20 pp., illus., processed, Commissie T.W.O.Z., University of Agriculture, Ostend, Belgium.

Prospective Developments in Harvest of Marine Fishes, by D. L. Alverson and N. J. Wilimovsky, 16 pp., illus., processed, Exploratory Fishing and Gear Base, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

Shrimp Behavior Related to Gear Research and Development, by C. M. Fuss, Jr., 12 pp., illus., processed, U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Fla.

GENERAL:

Preliminary List of Information Sources Relating to Fisheries Sciences, by A. Soulier, Occasional Paper 64/4, 13 pp., printed, 1964. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

Sea Fishing for Pleasure and Profit, by R. C. O'Farrell, 126 pp., illus., printed, Fishing News (Books) Ltd., Ludgate House, 110 Fleet St., London EC4, England.

GERMAN FEDERAL REPUBLIC:

Fischerei, I--Fangergebnis der See- und Küstenfischerei, 1963 Vorbericht (Fisheries, I--High-Seas and Coastal (Fishery) Catch Results, 1963 Preliminary Data), Land- und Forstwirtschaft, Fischerei, Series 4, 7 pp., processed in German, Verlag W. Kohlhammer GmbH, Stuttgart und Mainz, German Federal Republic.

Informationen für die Fischwirtschaft, vol. 11, no. 2, 1964, 37 pp., illus., processed in German. Bundesforschungsanstalt für Fischerei, Palmalle 9, Hamburg-Altona 1, Federal Republic of Germany. Includes, among others, these articles: "Westafrika-reise des FFS Walther Herwig" (West Africa voyage

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of the fishery research vessel Walther Herwig, by A. von Brandt; "Die Fanggebiete der Deutschen fischerei" (The fishing grounds of German fisheries), by A. Meyer; "Impulszahlen und stromdichtewerte beim elektrischen aalfang" (Impulse and current density in electrofishing for eels), by E. Halsband; and "Zur frage der qualitat und haltbarkeit auf see tiefgefrorener und an land aufgetauter fische" (The quality and keeping properties of fish frozen at sea and thawed on land), by N. Antonacopoulos.

Informationen fur die Fischwirtschaft, vol. 11, no. 3, 1964, 41 pp., illus., processed in German. Includes, among others, these articles: "Die verhandlungen der Nordostatlantischen Fischerei-Kommission" (Negotiations of the Northeast Atlantic Fisheries Commission), by D. Sahrhage; "Die internationale diskussion uber die schonung der Nordsee-heringe" (The international discussions on the conservation of the North Sea herring), by G. Hempel; and "Monatskarten der Deutschen grossen heringsfischerei fur 1963 (Monthly reporting on German high-seas herring fishery for 1963), by K. Schubert.

GROUND FISH:

The Homogeneity of Canadian Samples for Lengths and Ages of Commercially-Caught Cod and Haddock, by L. M. Dickie, Manuscript Report Series (Biological) No. 787, 5 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

GULF OF MEXICO:

Bulletin of Marine Science of the Gulf and Caribbean, vol. 14, no. 3, 1964, 147 pp., illus., printed, single copy \$2. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149. Contains, among others, articles on: "Tagging experiments on the flying fish Hirundichthys affinis (Gunther)," by John B. Lewis; "A note on three specimens of the squid Lampadoteuthis megaleia Berry, 1916 (Cephalopoda: Oegopsida) from the Atlantic Ocean, with a description of the male," by Richard E. Young; and "A note on some cephalopods from Brazil, with a description of a new species of octopod, Eledone Massyae," by Gilbert L. Voss.

HALIBUT:

Investigation, Utilization and Regulation of the Halibut in Southeastern Bering Sea, by Henry A. Dunlop and others, Report No. 35, 72 pp., illus., printed, 1964. International Pacific Halibut Commission, Fisheries Hall No. 2, University of Washington, Seattle 5, Wash. Reviews the pertinent facts regarding the halibut, the fishery, and the management and utilization of the resource in the north Pacific Ocean and Bering Sea. Covers the occurrence of halibut in the Bering Sea, early life history of the halibut and hydrography of its habitat, commercial availability in the Bering Sea, review of regulations, statistics of the Canadian and United States set-line fishery, and Japanese and Russian trawl fisheries. It also discusses tagging studies conducted between 1930 and 1959, studies of the composition of the stock, growth studies, stock relationships, utilization of the catch, and maximum sustainable yield from Area 3B North Triangle.

HERRING:

"Brown discoloration in pickled herring," by A. Ruiter, article, Deutsche Lebensmittel-Rundschau, vol. 59, no. 4, 1963, pp. 110-111, printed in German. Wissenschaftliche Verlagsgesellschaft, m.b.h., Birkenwaldstrass 44, Stuttgart N., Germany.

"Chemical studies on the herring (Clupea harengus). IX--Preliminary gas-chromatographic study of volatile sulphur compounds produced during the cooking of herring," by R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 15, May 1964, pp. 290-292, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Free Amino Acids in Hard Herring Roe. Variation during the Ripening Process, by Egil T. Gjessing, Fiskeridirektoratets Skrifter Serie Teknologiske Undersøkelser, vol. 4; no. 7, 1963, 8 pp., printed. Fiskeridirektoratets, Bergen, Norway.

"Markierungen an Rügenschon frühjahrsheringen in jahre 1961" (Tagging Rugen spring herring in 1961), by Karl Anwand, article, Internationale Revue der Gesamten Hydrobiologie, vol. 48, no. 2, 1963, pp. 315-323, printed in German. Internationale Revue der Gesamten Hydrobiologie, Berlin, Germany.

"Maturation of fatty Pacific salted herring packed in refrigerator drawers," by L. K. Bukhriakova, article, Sb. Rabot. po Biol. Takhn. Rybolovstva i Takhnol. Tikhookeansk. Nauchno-issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, no. 1, 1960, pp. 74-81, printed in Russian. Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia Ul. No. 17, Moscow, U.S.S.R.

Poissons du Quebec: Album No. 7, Le Hareng (Fishes of Quebec; Album No. 7, the Herring), by Jean-Marie Roy, 16 pp.; 23 pp. translation, illus., printed, French and English, respectively, 1964, 50 Canadian cents. Division des Pêcheries, Ministère de l'Industrie et du Commerce, Quebec, Que., Canada. Discusses the herring's systematic position, common names, distinctive characteristics, habitat, size and weight, sex characteristics, spawning, food, and growth. Also covers herring enemies; geographical distribution; fishing methods--gill-net, drift-net, weir fishing, boat seine, and herring trap; importance of the Quebec fishery; and utilization of the catch.

"The question of the origin of betabacteria (lactobacteria) in marinated herring," by K. Priebe, article, Archiv fur Lebensmittelhygiene, vol. 13, no. 12, 1962, pp. 278-281, printed in German. Verlag M & H Schaper, Grazer Str., 20, Hannover, Germany.

Review of Canadian Herring Fishery and Research in the ICNAF Area, 1963, by S. N. Tibbo, Manuscript Report Series (Biological) No. 791, 4 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

"Volatile acids as basis for estimating suitability of fish for consumption. I--Salted herring," by J. Wierchowski and M. Severin, article, Roczniki Panstwowe go Zakladu Higieny, no. 13, 1962, pp. 301-305, printed.

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ed in Polish with summaries in English and Russian. Panstwowy Zaklad Wydawnictw Lekarskich, ul. Chocimska, 22, Warsaw, Poland.

ICE:

"L'approvisionnement des bateaux de pêche en glace hydrique" (Supplying fishing boats with water ice), by A. d'Oiron, article, *Revue Generale du Froid*, vol. 41, no. 1, January 1964, pp. 27-34, illus., printed in French. Association Francaise du Froid, 29 Blvd. Saint-Germain, Paris (6^e), France.

ICELAND:

Foreign Trade Regulations of Iceland, by Ann C. Holmes, OBR 64-107, 8 pp., printed, Sept. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Iceland's import policy is closely allied with the operation of the fishery export industry. Her economy is highly dependent upon the maintenance of fish exports in order to pay for the importation of most necessities except some foods. Fishery products represent over 90 percent of Iceland's exports. The report discusses Iceland's trade policy; import tariff system; sales and other internal taxes; documentation; and labeling, marking, and packing requirements. Also covers special customs provisions; nontariff import controls; Iceland's export controls; United States foreign trade controls; and Government representation between the two countries.

ICHTHYOLOGY:

Anatomie der Fische (Anatomy of the Fish), by Wilhelm Harder, *Handbuch der Binnenfischerei Mitteleuropas*, vol. IIA, part 1 - 320 pp., part 2 - 123 pp., illus., printed in German, 1964, 94 DM paperback (about US\$23.50); 130 DM (about \$32.50) hardbound. E. Schweizerbart'sch Verlagbuchhandlung (Nagelle u. Obermiller), Stuttgart, Federal Republic of Germany. The author, Dr. Wilhelm Harder, is well known to many American fishery biologists. He spent some time here in the United States working at several biological laboratories. In the forward to his present work he indicates that a detailed volume on the anatomy of the fish has not appeared in German since the work of Stannius in 1854. Accordingly, he has taken upon himself the task of producing a detailed volume on this subject. The volume is in two separate parts; text and illustrations, so that it is possible to put the illustrations alongside the corresponding text. The main chapter headings, under which considerable specific detail is given, are as follows: basic elements of the organs, cells, and tissues; skeleton--skull, fins, skin structure, teeth; muscle structure; body cavity, digestive tract; urinary and sexual organs; circulatory system--heart, lymph nodes; organs of inner secretion; respiratory system; sensory organs; nervous system; and skin. There are 246 pages of text in German in the first part which also includes 13 tables and literature citations. The second part contains about 266 illustrations with 19 tables. Zoologists and zoological institutes, scientific aquaria, libraries of aquarium societies, biologists, fishery scientists will find this book of considerable value.

--W. H. Stolting

INDIA:

Fish Technology Newsletter, vol. 5, no. 2, July 1964, 17 pp., illus., processed. Central Institute of Fisheries Technology, Ernakulam, India. Includes, among others; articles on: "Canning of mackerel in oil;" "Fishery products of commerce. III--Fish maws;" "Design of a 85'-four seam trawl net for 120-130 hp. trawler;" and "Simple Techniques for Estimating Certain Characteristics of Otter Trawl Net in Operation."

Indian Seafoods, vol. 2, no. 1, June 1964, 30 pp., illus., printed. The Marine Products Export Promotion Council, Ernakulam, India. Includes, among others, articles on: "Council's activities--an assessment and prognosis;" "The Effect of prolonged storage in ice on prawn," by A. N. Bose; "Marine turtle fishery of India," by S. T. Chari; "Tuna long line operations in the west coast of India," by P. K. Eapen; "Export of shark fins;" "Exports of dried prawns from India during the years 1962 & 1963;" "Exports of marine products from India during the years 1962-63 & 1963-64;" "Exports of marine products from India during the months January to May 1963 and 1964;" "Exports of shark fins & fish maws from India during the years 1962 & 1963;" and "Exports of dried fish from India during the years 1962 & 1963."

INDIAN OCEAN:

"Le probleme de la peche dans le cadre de l'expedition oceanographique internationale dans l'océan Indien" (The fishery problem in the International Indian Ocean Expedition plan), by E. Postel, article, *La Pêche Maritime*, vol. 43, no. 1038, September 1964, pp. 638-645, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

INDUSTRIAL PRODUCTS:

"Preparation of fish concentrates for animals and birds," by A. P. Chernogortsev and V. I. Shenderyuk, article, *Chemical Abstracts*, vol. 60, June 8, 1964, 15064e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

INTERNATIONAL COMMISSIONS:

International Commission for the Northwest Atlantic Fisheries, Statistical Bulletin for the Year 1962, vol. 12, 78 pp., illus., printed, 1964, C\$3. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, P. O. Box 638, Dartmouth, N. S., Canada. This bulletin is divided into two parts: Part 1 summarizes statistics on fishery landings in the Convention area, 1952-1962; and Part 2 includes statistical tables dealing with the fisheries in 1962. The presentation of the basic statistical data again has been designed to place emphasis on area and month of fishing. Contains a summary of all landings by species group, country, and statistical subdivision; landings of cod, haddock, ocean perch, halibut, and flounder for each type of gear; landings of each species by subarea; and fishing effort and landings by country, gear, and subarea. Member countries include Canada, Denmark, France, Germany, Iceland, Italy, Norway, Poland, Portugal, Spain, U.S.S.R., United Kingdom, and the United States.

IOWA:

Quarterly Biology Reports, January, February, March 1964, vol. 16, no. 1, 61 pp., processed. Biology Sec-

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tion, Fish and Game Division, State Conservation Commission, E. 7th and Court Sts., Des Moines, Iowa. The section on fisheries contains the following articles: "Pleasure boat numbers as compared to fishing boats on several northwest Iowa Lakes, 1961, '62 and '63," by Tom Moen; "A brief preliminary report on commercial channel catfish," by Roger Schoumacker; "A fishery investigation of five Missouri River ox-bow lakes during 1963," by Bill Welker; and "Coralville Reservoir fisheries investigations, 1963. Part II--Limnology and fish populations," by Jim Mayhew.

IRRADIATION PRESERVATION:

"Perishables you can store on the shelf," article, *Business Week*, no. 1832, October 10, 1964, pp. 120, 123-124, illus., printed, single copy 50 cents. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036. Nuclear irradiation is making it possible to keep some foods, particularly meat and fish, longer than ever before--often even without use of refrigeration. Recently the first semicommercial irradiator in the country was dedicated at the U. S. Bureau of Commercial Fisheries' Technological Laboratory in Gloucester, Mass. Fish is a good prospect for irradiation to prevent spoilage since bacteria normally cause fish to decay quickly; irradiation destroys the bacteria. The new irradiator at Gloucester is equipped to irradiate one ton of fish an hour. Bureau of Commercial Fisheries' researchers have been irradiating haddock as well as mackerel and lobster. On ice, the fish will keep for about 10 days; limited radiation treatment makes it possible to extend refrigerated shelf life to 30 days. The fishing industry has a big potential for market expansion, particularly in inland areas, if only its product could be made less perishable.

"Radiation preservation of marine products: U.S.A., E.C. Programme," by E. Machureck, article, *Irradiation des Aliments* (Food Irradiation), vol. 4, April-June 1964, pp. A2-A7, illus., processed, European Information Centre for Food Irradiation, P. O. Box No. 6, GIF-sur-Yvette (S.-et-O.), France. This program is directed to those marine products showing the most promise as evaluated by the Massachusetts Institute of Technology. The original list included soft-shell clams, haddock, clams, shrimp, Pacific crab, and flounder. Recently, freshwater perch and smoked chub have been added. Primary emphasis has been on the determination of process technology and the establishment of wholesomeness and safety. If large-scale tests bear out the very successful laboratory results, it is hoped that, through the U. S. Department of the Interior, the National Fisheries Institute, and others, industry may be induced to attempt commercialization.

"Review of the United States Army irradiated food wholesomeness program," by M. E. MacDowell and N. Raica, article, *Nuclear Science Abstracts*, vol. 17, 1963, 38736, printed. United States Atomic Energy Commission, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

JAPAN:

Bulletin of the Faculty of Fisheries, Nagasaki University, no. 15, December 1963, 117 pp., illus.,

printed in Japanese with English abstracts. The Faculty of Fisheries, Nagasaki University, Nagasaki, Japan. Contains, among others, these articles: "On diethylene glycol succinate monoester as a stationary liquid phase in gas-chromatography of methyl esters of fatty acids and on the chromatographic study of horse-mackerel oil," by Shojiro Miyahara and Yoshiaki Tabata; "On the presence of tyrosinase in the byssus or mucus gland of the bivalves," by Buhei Zenitani and Tadataka Taniguti; "Analysis of fish finder records. III--On a dynamical study of external force on the tuna longline and control of the hook depth," by Keishi Shibata and Shigeaki Yada; "IV--Report on the deep scattering layers and tuna food," by Keishi Shibata.

Bulletin of the Faculty of Fisheries, Nagasaki University, no. 16, March 1964, 138 pp., illus., printed in Japanese with English summary. The entire issue consists of the article: "Ecological studies on marine fouling animals," by Takesi Kazihara.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, no. 4, April 1964, 79 pp., illus., printed in Japanese and English. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan. Includes, among others, these articles: "Annual variation of longline catch-rate of big-eyed tuna in the eastern Pacific tropical waters," by Jun Nakagome and Hirotaka Suzuki; "Fundamental studies on the production of alginic acid. II--Examination of the condition of acid treatment; III--On the change of membrane potential of algae by acid treatment," by Yuzo Harada; "Studies on muscle of aquatic animals. XXXII--Species difference in fish actomyosin (Part 2)--Relation between heat-denaturing point and species," by Tadao Ueda, Yutaka Shimizu, and Wataru Simidu; "Biochemical studies on L-Ascorbic acid in aquatic animals. III--Biosynthesis of L-Ascorbic acid by carp," by Shizunori Ikeda and Mamoru Sato; and "Studies on the nutritive values of lipids. XIV--Preliminary experiments of using the fatty acids fraction of sperm whale oil and methyl ester of rice bran oil for animal feed," by Takashi Kaneda and Kimie Arai.

Contributions from the Department of Fisheries and the Fishery Research Laboratory, Kyushu University, no. 9, 1963, 125 pp., illus., printed in Japanese and English, July 1964. Department of Fisheries and Fishery Research Laboratory, Kyushu University, Fukuoka, Japan. Includes, among others, these articles: "Sargassum vegetation growing in the sea around Tsuyazaki, North Kyushu, Japan," by T. Yoshida, T. Sawada, and M. Higaki; "Inactivation of chlortetracycline in muscle tissue and method for its stabilization," by T. Tomiyama and K. Kitahara; "The reactions of fishes to toxic substances. III--The reactions of fishes to hydrogen ion," by S. Ishio; "Studies of the external mucous substance of fishes. VIII--Quantitative analysis of the mucus-polysaccharide from some fishes. 2--Basic and acidic sugar composition," by N. Enomoto, H. Nagatake, and Y. Tomiyasu; "A practical method of detecting boric acid added as preservatives to Kamaboko (fish jelly product)," by N. Enomoto and Y. Tomiyasu; "Lipid oxidation and protein denaturation in freeze-dehydrated fish," by M. Toyomizu, Y. Matsumura, and

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Y. Tomiyasu; "Discoloration of Lyophilized fish," by M. Toyomizu, F. Orita, and Y. Tomiyasu; and "Discoloration of marine animal products. II--Review," by M. Toyomizu and Y. Tomiyasu.

Hokusuishi Geppo (Hokkaido Fisheries Experimental Station Monthly), vol. 21, no. 9, September 1964, 48 pp., printed in Japanese. Hokkaido Fisheries Experimental Station, 238-banchi, Hamanaka-cho, Yoichi, Hokkaido, Japan. Includes, among others, these articles: "Eastern Bering Sea herring; plans concerning the reproduction of White Sea herring;" and "Fishing gear and fishing methods employed in the Soya region," by T. Takahashi and T. Fukuda.

--Lorry M. Nakatsu

Japan's Fishery Industry, 19 pp., illus., printed, April 1964. Japan Fisheries Association, Tokyo, Japan. Discusses briefly recent development of the Japanese fisheries industries; types of fisheries--whaling, tuna, salmon, factoryship crab, saury lift-net, purse-seine, squid angling, and coastal; aquiculture--pearl, oyster, fresh-water fish, and salt-water fish; conservation of marine resources--survey and research, regulations on fisheries, and expansion of culture activities; improvement of fisheries technique; fishing vessels and ports; and fishermen's organizations.

Japan's World Success in Fishing, by Georg Borgstrom, 312 pp., illus., printed, 1964, £2 15s. plus postage 2s. 6d. (\$8.25). Fishing News (Books) Ltd., 110 Fleet St., London EC4, England. Food from the sea is essential in order for Japan to feed its population of 90 million. In addition, Japan has developed an important export business for fishery products and that trade is important as a source of earning foreign currency to pay for her imports. There has been a great deal written about Japan's efforts and fisheries, but now this book brings the story together into one place. The whole field of Japanese fishery activities from farming fish in their inland sea to fishing by their large fleets of motherships and factoryships all over the world is covered in this book. The author expertly describes the background of Japan's amazing success in fishing all the oceans of the world.

Discussed is the over-all master plan of governmental guidance implemented practically by private enterprise. Included in the plan was the building of mothership fleets, supported by attendant catchers, factoryships for processing fishery products in distant waters, refrigerated carrier vessels for transportation to domestic and foreign markets, the erection of shipbuilding yards, net-making factories and food-processing equipment, and the establishment of bases and links with countries overseas.

The extensiveness of Japan's marine fishing fleet is easily realized when one considers that she has over 188,000 vessels engaged in marine fishing with a gross tonnage of 1,609,709. Her foreign ramifications are revealed by the fact that 200 of her vessels are foreign-based, and overseas fishery enterprises are either planned or operating in over 50 countries. Also, 3 million people directly depend upon Japan's fishing industry for their livelihood. Up to a year or two ago, Japan was the leading producer of fishery products in the world.

In his introduction the author establishes the theme that "the world is engaged in a global war for food and that the oceans are in the front field of this great battle." Revealed by the author are the agreements and disagreements Japan has had with the Soviets since the beginning of the 20th century. Chapters in the book deal with the main features of Japanese fisheries, the processing industry, specialized processing, seaweeds, the international and domestic markets, and regional and global fisheries. One chapter is devoted to the Tsushima long-term plan which, according to the author, was primarily responsible for the rapid development of Japanese fishery enterprises and world-wide exploitation of the oceans. There are chapters dealing with the development of motherships and floating factories; the incentive to increase the fishery catch from the Pacific, the Indo-Pacific area, the Atlantic, the Mediterranean, the Caribbean; the exploitation of whaling and sealing; exploratory fishing; education and research; special international commissions; present international tensions; and global aspects. Covered are postwar trends and technical advances made in the vessels used and the equipment and gear with which they are fitted; also some information about Japan's three largest fishing firms with interests in every segment of the fishery industries. He shows catches and landings of tuna in Japan proper and overseas, and discusses the profitability of motherships as compared with overseas bases. In the last chapter the author makes a number of pertinent observations, discusses the economics, and comments on the relationship between man and the resources of the sea.

Photographs, maps, and an adequate index add to the book's usefulness. Among the many sources the author used to obtain information, he cites the U. S. Fishery Market News and Commercial Fisheries Review. Anyone interested in any aspect of the world's fisheries and Japan's, in particular, will find this book enlightening and indispensable. Those interested in foreign trade will find much of value in it.

--Joseph Pileggi

New Fishing Boat in Japan, 2nd Edition, 130 pp., illus., printed in Japanese with English table of contents, August 1964. The Fishing Boat Association of Japan, Tokyo, Japan. Presents information on each steel and wooden fishing vessel classified as fisheries training boat, fisheries research boat, oceanographic research vessel, fisheries inspection boat, refrigerated fish carrier, refrigerated fish factoryship, stern trawler, small trawler, tuna long-line boat mothership, tuna long-line fishing boat, skipjack pole and line fishing boat, purse seiner fish carrier, salmon drifter, and cod long-line fishing boat. Includes a photograph of each vessel.

Technical Report of Fishing Boat, No. 18, printed in Japanese with English abstracts. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan.

JORDAN:

Foreign Trade Regulations of Jordan, by Jackson B. Hearn, OBR 64-115, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For

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sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Jordan's trade controls are applied largely for balance of payments and revenue purposes and are designed to adjust imports to the market requirements of local industry. In addition to trade policy, the report discusses import tariff system, documentation, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, Jordan's export controls, United States foreign trade controls, and Government representation between Jordan and the United States.

LATIN AMERICAN FREE TRADE ASSOCIATION:

"LAFTA 4th annual session now considering further 9-member tariff reductions," article, International Commerce, vol. 70, no. 43, October 26, 1964, p. 15, printed, single copy 35 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Discusses the Fourth Annual Session of the Conference of the Latin American Free Trade Association (LAFTA), opening October 20, 1964; and meeting to negotiate further tariff cuts among the 9-member organization and to determine certain policy questions. The 3 previous conference meetings resulted in some 8,200 tariff concessions. Under the Treaty of Montevideo of 1960, which established the LAFTA organization, members obligated themselves to lower trade barriers by 8 percent in relation to barriers to third countries during each annual meeting on the national schedules. The Secretariat reported that there was tentative agreement on a list of items accounting for about 26 percent of intra-LAFTA trade.

LOUISIANA:

10th Biennial Report, 1962-63, 211 pp., printed, 1964. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La.

MALAWI:

Annual Report of the Department of Game, Fish and Tsetse Control for the Year 1962, Part I, 55 pp., processed, 1964, 4s. (about 55 U. S. cents). Government Printer, Zomba, Malawi. A report by the newly-independent Republic of Malawi, formerly the British dependency of Nyasaland, in southern Africa. The section on fisheries discusses the state of the fish stocks, large-scale fishery under license, small-scale fishery not subject to license, the fish trade, development work, training and promotion, and experimental work. Also covers fisheries research, trout fishing, and fish farming. Included are tables showing landings by gear and by species, fishery products exports, nets used in the subsistence fishery, average catch per haul, catch of more important species in Lake Nyasa, and trout landings.

MARINATED FISH:

"Lactic acid bacteria in fish marinades," by V. Meyer, article, Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene, vol. 184, 1962, pp. 296-301, printed in German. Gustav Fischer Verlag, Villengang 2, Jena, Federal Republic of Germany.

MARINE FISHERIES:

Ocean Fisheries, Pre-Publication Issue, July 1964, 32 pp., illus., printed. Ocean Fisheries, Circulation Department, 500 Howard St., San Francisco, Calif. 94105. The pilot issue of a new periodical which will commence quarterly publication in 1965 and which will seek to report the advancing, expanding fisheries with notable potential throughout the world. This issue contains these articles: "Coastal fisheries jurisdiction and resources of the continental shelf," by D. F. Miller; "Prodigious Peru--4-month fish meal output far ahead of 1963 record," by Charles S. Sinclair; "Iceland--world's first purse seiner with active rudder and bow-thruster," by W. Nitter Egenaes; "Mexico--moves mightily to reap the sea;" "Japan--Kanagawa freezer designed to compete for tuna trade," by Kenji Sakai; "1964 international notes of a fishery consultant," by Borti Petrich; "Strait of Magellan--centolla crab freezing promising," by Dietrich Angerman; "Australia--1963-64 catch of tuna sets up a new record," by R. M. Fowler; and "City of Tacoma--last word in tuna seiners."

MARINE FOULING:

Marine Fouling and Its Prevention, Woods Hole Oceanographic Institution Contribution No. 580, 396 pp., illus., printed, 1952, \$10. United States Naval Institute, Annapolis, Md. This book is divided into three parts. Part I, problems of fouling, covers the effects of fouling, and ship resistance. Part II, biology of fouling, contains chapters on the fouling community, temporal sequences and biotic successions, the seasonal sequence, quantitative aspects of fouling, geographical distribution, relations to local environments, the principal fouling organisms, and species recorded from fouling. Part III, prevention of fouling, includes chapters on the history of prevention of fouling, the invention of protective devices, factors influencing the attachment and adherence of fouling organisms, the prevention of fouling with toxics, the physical chemistry of compounds of copper and mercury and their interactions with sea water, and mechanisms of release of toxics from paints. Also includes chapters on the dissolution of the matrix and its ingredients, characteristics of antifouling coatings, the design of antifouling paints, the testing of antifouling paints, the fouling of metallic surfaces, and interaction of antifouling paints and steel.

MASSACHUSETTS:

Annual Report, Fiscal Year July 1, 1962-June 30, 1963, 74 pp., illus., processed, September 1, 1963, 22 cents. Division of Marine Fisheries, Department of Natural Resources, 15 Ashburton Pl., Boston 9, Mass.

MAURITANIA:

"La Mauritanie n'est pas le Perou" (Mauritania is not Peru), by Georges Freris, article, France Pêche, no. 87, September 1964, pp. 48-51, illus., printed in French, single copy 2.5F (about 50 U. S. cents). France Pêche, Boite Postale, Lorient, France.

MENHADEN:

Some Peculiarities in Menhaden Morphology - BREVO-ORTIA TYRANUS (Latrobe), by E. E. Gusev, 4 pp., processed, August 1964. (Translated from the Russian, Contributions to Commercial Fisheries Research of the Arctic Basin, no. 2, 1964, pp. 13-16.) Marine Biological Laboratory, Woods Hole, Mass.

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MEXICO:

The following publications, printed in Spanish, are available from Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

Algunos Aspectos Biologicos del Pescado Blanco del Lago de Patzcuaro, Mich. (CHIROSTOMA ESTOR Jordan, 1879) (Some Biological Aspects of the White Fish of Patzcuaro Lake, Mich.--*Chirostoma estor* Jordan, 1879), by Aurelio Solorzano Preciado, 12 pp., illus., 1963.

Breve Reseña sobre las Principales Artes de Pesca Usadas en Mexico (Brief Review of the Principal Methods of Fishing Used in Mexico), by Pedro Mercado Sanchez, 79 pp., illus., 1959.

Contribucion al Conocimiento de la Biologia del Charal Prieto del Lago de Patzcuaro, Mich. (CHIROSTOMA BARTONI Jordan y Evermann, 1896) (Contribution to the Knowledge of the Biology of the White Fish of Patzcuaro Lake, Mich.--*Chirostoma bartoni* Jordan and Evermann, 1896), by Aurelio Solorzano Preciado, 70 pp., illus., 1961.

Investigaciones Ictiologicas en la Costa de Chiapas--Lista de Peces Colectados en las Capturas Camaroneras (Agosto y Septiembre de 1959 y Abril, Mayo y Junio de 1960) (Ichthyological Investigations along the Chiapas Coast--List of Fish Collected in the Shrimp Landings--August and September 1959 and April, May, and June 1960), by Ernesto Ramirez H., Guillermo Carrillo, and Daniel Lluch B., 15 pp., 1964.

Los Peces del Valle de Mexico (The Fishes of the Valley of Mexico), by J. Alvarez del Villar and Leopoldo Navarro G., 62 pp., illus.

The following publications, all part of the series: "Trabajos de Divulgacion," processed in Spanish, are available free from Direccion General de Pesca, Secretaria de Industria y Comercio, Mexico, D. F.

El Problema Pesquero Nacional (The National Fishery Problem), by Rodolfo Ramirez Granados, vol. I, no. 3, 45 pp., June 1959 (reprinted July 1963).

Extracto sobre la Biologia de los Camarones del Genero PENAEUS en Aguas Mexicanas (Summary of the Biology of the Shrimp of the Genus *Penaeus* in Mexican Waters), by Pedro Mercado Sanchez, vol. I, no. 5, 19 pp., illus., August 1959 (reprinted May 1963).

El Aprovechamiento del Pescado, Recurso Olvidado (Utilization of the Fishery, Forgotten Resource), by Juan Manuel Tibon, vol. I, no. 6, 15 pp., September 1959 (reprinted July 1963).

Las Pruebas Quimicas en la Determinacion de la Frescura o Calidad en la Carne de Pescado (A Chemical Method for Determining the Freshness or Quality of Fish), by Manuel Calvo Mendoza, vol. II, no. 11, 9 pp., illus., December 1960 (reprinted August 1963).

Clave para los Scienidos (Sciaenidae: Curvinas, Berugatas, etc.) del Pacifico Oriental (Key to the

Sciaenids--Sciaenidae: Croaker or Corbina, Berugate, etc.--of the Eastern Pacific), by J. D. McPhail, vol. II, no. 12, 28 pp., illus., December 1960, reprinted December 1963, (Translated from the English, Museum Contribution No. 2, Institute of Fisheries, University of British Columbia, Vancouver, Canada, November 1958.)

Posibilidades Ostricolas de Mexico (Possibilities of Oyster Culture in Mexico), by Maria Luisa Sevilla, vol. II, no. 13, 14 pp., December 1960 (reprinted July 1963).

Guion para el Estudio de los Recursos Pesqueros de Mexico (Guide to the Study of the Fishery Resources of Mexico), by Maria Luisa Sevilla, vol. III, no. 22, 26 pp., illus., January 1962.

Contribucion al Estudio del Pulpo (OCTOPUS VULGARIS Lamarck) de la Sonda de Campeche (Contribution to the Study of the Octopus--*Octopus vulgaris* Lamarck--of Campeche Sound), by Manuel J. Solis Ramirez, vol. III, no. 24, 33 pp., illus., April 1962.

Plan de Trabajo a Desarrollar por las Estaciones del Instituto Nacional de Investigaciones Biologico-Pesqueras (Work Plan for Improving the Status of the National Institute of Fishery Biological Investigations), by Rodolfo Ramirez G., Hector Chapa Saldana, and Mauro Cadenas F., vol. IV, no. 32, 31 pp., September 1962.

Clave Dicotomica para la Determinacion de los Ordenes de Crustaceos (Dichotomous Key for the Determination of the Orders of Crustaceans), by Federico Bonet Marco, vol. IV, no. 39, 87 pp., January 1963 (reprinted November 1963).

Principales Lugares para Practicar la Pesca Deportiva en Aguas Dulces, Salobres y Maritimas de la Republica Mexicana (Principal Places for Sport Fishing in Fresh, Brackish, and Salt Waters of the Republic of Mexico), vol. IV, no. 40, 13 pp., January 1963.

Langostas (Crustacea Decapoda) Identificacion, Distribucion, Comercio (Spiny Lobster--Crustacea Decapoda--Identification, Distribution, and Trade), by Fenner A. Chace Jr. and William H. Dumont, vol. V, no. 46, 42 pp., March 1963.

Tecnologia Aplicada en la Elaboracion de Alimentos a Partir de Material Marino (Technology Applied to the Manufacture of Food from Marine Products), by Carlos E. Perez Bacera, vol. V, no. 47, 13 pp., March 1963.

Aspectos Generales sobre las Ranas y su Cultivo (General Observations on Frogs and Their Cultivation), by Federico Aguilar Ibarra, vol. V, no. 49, 23 pp., April 1963.

Jamon y Salchicha de Pescado (Fish Ham and Sausage), by K. Ishiguro, vol. V, no. 50, 26 pp., illus., May 1963. (Translated from the Japanese, Chiba Fishing Net Co., Ltd., Tokyo, Japan.)

Claves de Identificacion para Cangrejos Cancroideos de America (Key to Identification of Cancroid Crabs of America), by Mary J. Rathbun, vol. VI, no. 51, 86 pp., illus., May 1963. (Translated from the English,

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The Cancroid Crabs of America of the Families Euryalidae, Portunidae, Atelecyclidae, Cancridae and Xanthidae, Bulletin No. 152, U. S. National Museum, Washington, D. C., 1930.)

Notas sobre Algunos Peces de Importancia Comercial en los Estados de Tamaulipas y Veracruz (Notes on Some Fish of Commercial Importance in the States of Tamaulipas and Veracruz), by Ernesto Ramirez H., vol. VI, no. 52, 13 pp., May 1963.

Las Algas Marinas como Recurso Natural Explotable. La Necesidad de Realizar en Mexico Estudios Sistemáticos y Bioquímicos de Este Recurso (Marine Algae as a Natural Exploitable Resource. The Need to Conduct in Mexico Systematic and Biochemical Studies of this Resource), by Sergio A. Guzman del Proo, vol. VI, no. 53, 10 pp., May 1963.

Anteproyecto para el Estudio de las Posibilidades Ostrícolas en el Estado de Nayarit (Preliminary Plans for the Study of the Possibilities of Oyster Culture in the State of Nayarit), by Federico Aguilar Ibarra, vol. VI, no. 55, 12 pp., May 1963.

Prospeccion Acerca de las Tortugas Marinas de Mexico (Prospects with Regard to the Marine Turtles of Mexico), by Aurelio Solorzano P., vol. VI, no. 54, 14 pp., illus., May 1963.

Difusion Biológico Pesquera y Conservacion (Diffusion of Fishery Biology and Conservation), by Mauro Cardenas Figueroa, vol. VI, no. 56, 21 pp., May 1963.

Notas sobre las Investigaciones del Camaron en el Noroeste y los Resultados Practicos Obtenidos (Notes on the Investigations of the Shrimp of the Northeast and the Practical Results Obtained), by Federico Aguilar I., vol. VI, no. 57, 5 pp., May 1963.

Asesoría Técnica y Científica para el Desarrollo de las Actividades Pesqueras en Nayarit (Technical and Scientific Advice for the Development of Fishing Activities in Nayarit), by Federico Aguilar Ibarra, vol. VI, no. 58, 52 pp., illus., May 1963.

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MINK RATIONS:

"Trials with different amounts of Icelandic cod waste (from fillets and trimmings) in feeds for young mink," by G. Jorgensen, article, *Dansk Pelsdyravt.*, vol. 24, 1961, pp. 164-166, printed in Danish. *Dansk Pelsdyravt.*, Sdeasy 8, Copenhagen, Denmark.

"Trials with redfish (*Sebastes marinus*) for young mink," by G. Jorgensen, article, *Dansk Pelsdyravt.*, vol. 25, 1962, pp. 271-274, printed in Danish.

MOLLUSCS:

Distribution and Variation in Abundance of Benthic Molluscs in the Konfederatka Pool at Wyszogród (Rozmieszczenie i Dynamika Liczebności Miecza-kow Dennyh na Lasze Wislanej Konfederatka Pod Wyszotrodem), by Anna Stanczykowska, OTS 63-11400, 13 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, *Ekologia Polska*, vol. 8, no. 7, 1960, pp. 155-168.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

NATURAL RESOURCES:

World Prospectus for Natural Resources--Some Projections of Demand and Indicators of Supply to the Year 2000, by Joseph L. Fisher and Neal Potter, 78 pp., illus., printed, 1964, \$1.50. The Johns Hopkins Press, Baltimore, Md. 21218. In recent times the population explosion in the underdeveloped countries and very rapid increases in most of the more developed nations have led to a reawakening of concern about the capacity of the natural environment and its resources to sustain desired rates of economic growth. Science, technology, and the economic adaptation of their accomplishments are seen as pitted against the sheer increase of population, which in many less developed areas is now running at 3 percent a year. Continuation of this rate would mean a doubling every 24 years. Clearly the population problem is not simply one of numbers of people, but also of natural resources and how they are used. Information is presented on the question of resource adequacy, the case of the United States, world trends in resources, projections of resource demands, and reserves and alternate supply possibilities. The contribution which the world's fisheries can make to better diets has never been adequately explored, but it is undoubtedly large, state the authors.

NEW ZEALAND:

Report of the Marine Department for the Year Ended 31 March 1964, 53 pp., printed, May 7, 1964, 2s. (about 28 U. S. cents). R. E. Owen, Government Printer, Wellington, New Zealand. A large portion of this report is devoted to New Zealand's fisheries during 1963. Included is information on total quantity and value of fishery products marketed in calendar year 1963, spiny lobsters, fishing vessels and per-

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sonnel, landings by species, methods of capture, landings by ports, exports and imports of fishery products, big-game fishing, fish-liver oil, and whaling. Also includes information on rock oysters, dredged oyster, whitebait fishing--1963 season, mussels, angling licenses, research and investigation, Fishing Industry Advisory Council, Freshwater Fisheries Advisory Council, Fishing Industry Board, and legislation pertaining to fisheries.

NORTH KOREA:

Economic Report on North Korea, No. 126 (For Establishment of Scientific System of Fisheries, TT: 64-41357j, 14 pp., processed, August 24, 1964, \$1. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

NORWAY:

"Rogaland and the fisheries;" "Canned fish, a Stavanger specialty;" "Modernisation in canning;" "Canning machines;" "Dies for cans;" "Canning plant;" "Fish meal and oil plants," articles, Norway Exports, no. 3, Autumn 1964, pp. 41-43, illus., printed, Export Council of Norway, H. Heyerdahls Gate 1, Oslo 1, Norway. Discusses the fisheries of Rogaland in southwestern Norway. Fishermen in this area participate in the winter herring fishery, the North Sea trawl fishery, and the herring fishery off Iceland. Also important to the area are a canning laboratory and canning school. Included is information on the fish canning industry at Stavanger, where the industry commenced in 1841; the largest canning plant in Norway; a manufacturer of canning machines; a firm producing dies for the manufacture of aluminum and tinplate cans; a producer and exporter of fish canning equipment; and a fish meal and oil plant manufacturer.

NUTRITION:

Ocean Science and Human Protein Malnutrition Problems in Middle Africa, by Wilbert McLeod Chapman, 35 pp., printed, 1964. Institute of International Affairs, University of California, Berkeley, Calif.

OCEANOGRAPHY:

Geo Marine Technology, vol. 1, no. 1, November 1964, 62 pp., illus., printed, INTEL, Inc., 739 National Press Bldg., Washington, D. C. The first issue of a monthly technical periodical for ocean scientists. Intended principally as an effective medium of information exchange among those concerned with designing, engineering, and deploying systems in the total ocean environment. Contains the following articles: "Publishers note - What is GMT?" by Seabrook Hull; "Forum of the Institute of the Bent Trident"; "Ocean mining"; "Abstract - Methods of operation with anchored buoy stations"; "U.S.C. & G.S.," by E. John Long; "AGOR & post-AGOR," and "Space oceanography," by Seabrook Hull; "Search for materials data," by Walter F. Bohlen; "On Station (news)." Also an "Engineering reference file: Sea state chart - David Taylor Model Basin; Data sheet ads - cumulative index."

"Revival of oceanography in Germany," by Victor K. McElheny, article, Science, vol. 146, no. 3640, October 2, 1964, pp. 45-48, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

Selected Articles on Oceanography, OTS 63-11107, 50 pp., illus., processed, 1964, 50 cents. (Translated from the Russian.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Contains articles on: "Oceanographic guideposts in reconnoitering for fish in marine fisheries," by M. V. Fedosov; "Relationship between the tangential wind stress over an agitated water surface and the velocity of wind," by R. N. Ivanov; "Latest results of hydrological study of the Kuroshio current from the viewpoint of fishery oceanology," by V. V. Leont'ev; "Role of vertical stability of layers in development of deep-sea upwelling phenomena," by Yu. G. Ryzhkov; "Contribution to the method of the sorting of benthic hydrobiological samples," by S. N. Torsukov; "Apparatus for determination of the coefficient of attenuation of directed light in the sea," by V. A. Timofeeva; "A simplified method for computing the heat balance of the sea surface," by Ya. A. Tyutnev; and "Interferometric determination of the salinity of sea water," by Yu. A. Vel'mozhnaya.

OCTOPUS:

"El extraordinario pulpo vulgar" (The extraordinary common octopus), by Blas Venegas, article, Iberica Actualidad Científica, vol. 42, nos. 25-26, July-August 1964, pp. 291-294, illus., printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Iberica Actualidad Científica, Apartado 759, Palau, 3, Barcelona 2, Spain.

O.E.C.D.:

"Financial support to the fishing industries," article, The OECD Observer, no. 12, September 1964, pp. 36-37, illus., printed, single copy 50 cents. The Organisation for Economic Co-Operation and Development, Publications Office, 2, rue Andre-Pascal, Paris (16^e), France. Discusses a survey carried out recently by the OECD Fisheries Committee of the various systems of aid to fishing industries practiced by member countries--Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. It considered whether they were acceptable, having regard not only to increased trade in sea products but also the need to maintain healthy competition between member country industries. It concluded by specifically recommending that any financial support considered to have harmful effects should be gradually reduced and eventually discontinued.

"L'O.C.D.E. demande qu'il soit mis fin à la plupart des aides financières accordées aux industries de la pêche maritime dans les pays membres" (The O.E.C.D. requests an end for most of the financial aids granted to marine fisheries of the member countries), article, La Pêche Maritime, vol. 43, no. 1038, September 1964, pp. 631-637, printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

OYSTERS:

Comments on the Occurrence and Nature of Certain Types of Coloration in Oysters, by G. Francis Beaven, Reference No. 64-4, 5 pp., processed, January 30, 1964. Natural Resources Institute, the University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. The presence or development of any color

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in shucked oysters other than that which is considered a normal oyster gray-white often arouses concern in the industry and may cause consumer rejection of the product. Few instances of color development can be prevented; most are a natural occurrence; and of those studied the quality of the oysters seldom is adversely affected. In order to reduce the instances of alarm expressed by those unfamiliar with normal development of color, this summary briefly describes instances of colored oysters or oyster liquor and the apparent cause where studies of the condition have been made. Everyone should recognize that many marked color differences among shellfish are normal, do not harm the animal or its value as food, and should not be an occasion of uncalled for alarm.

Crisis Ostricolas en Mexico y su Recuperacion (Oyster Culture Crisis in Mexico and its Recovery), by Fernando de Buen, 46 pp., illus., printed in Spanish, 1957. Direccion General de Pesca e Industrias Conexas, Secretaria de Marina, Mexico, D. F.

"Observations on the length-weight relationship of pearl oysters," by K. Alagaraja, article, Marine Biological Association of India Journal, vol. 4, no. 2, 1962, pp. 198-205, printed. Marine Biological Association of India, Marine Fisheries, P. O., Ramanathapuram Dist., South India.

"Preliminary observations on the growth of spat of the oyster *Crassostrea gryphoides* (Schlotheim)," by V. S. Durve and D. V. Bal, article, Marine Biological Association of India Journal, vol. 4, no. 2, 1962, pp. 206-213, illus., printed.

PACIFIC OCEAN:

Differentiation of Geographical Zones of Central Pacific (Scope and Basic Methods of Geographical Zonation) (Kharakteristika Geograficheskikh Zon Tsentral'noi Chasti Tikhogo Okeana--k Postanovke Problemy i Metoda Resheniya), by V. G. Bogorov, OTS 64-11100, 5 pp., processed, 1964, 50 cents. (Translated from the Russian, Biologiya Morya, Trudy Okeanograficheskoi Komissii Akademii Nauk SSSR, vol. 10, no. 4, 1960, pp. 3-7.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

PELAGIC FISH:

Review of Canadian Fishery and Research on Large Pelagic Fish in the ICNAF Area in 1963, by S. N. Tibbo, Manuscript Report Series (Biological) No. 792, 5 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

PERSIAN GULF:

Shrimp, Pearl and Sardines of the Persian Gulf, by Ismail Rostami, Publication No. 9, 68 pp., illus., printed in Persian and English, August 1964. Ahwaz Agricultural College, Molla Sani, Iran. Contains three articles on unrelated subjects. "A brief study on biology and the economic importance of shrimp," discusses the most important species (*Penaeus setiferus*, *P. aztecus*, and *P. duorarum*); hydrology of the Persian Gulf; gear used (otter-trawls, stake fences, nets, and shore seines); development of the fishery by Iranian, Kuwaiti, and Pakistani firms;

quantity and value of landings; and need for further exploratory fishing. "Pearl and its exploitation in the Persian Gulf," covers pearl formation and characteristics; mollusks producing pearls (*Meleagrina margaritifera*, *M. vulgaris*, and *M. martensi*); natural resources and control of their exploitation; fishing methods; pearl fishing regions (Red Sea, Persian Gulf, Ceylon, Madagascar, Japan, Australia, and Central America) and seasons; Japanese method of pearl culture; artificial pearls; and fisheries in the Persian Gulf. "Biology and fishing of sardines of southern Iran," presents information on species found in southern Iranian waters (*Sardinella perforata*, *S. fimbriata*, *S. sindensis*, *S. melanura*, and *S. sirm*); size, weight, and oil content; fishing grounds; utilization of catch; influence of temperature on fishing; fluctuation of populations; and landings (about 12,000 metric tons annually). Also included in the latter article are data on size and weight of sardines by sex, distribution of catch by districts, catch utilization, sea surface temperatures and percentage of catch, and delivery of raw sardines to the cannery.

PERU:

Foreign Trade Regulations of Peru, by Bruce B. Sever, OBR 64-99, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Peru's trade policy is designed chiefly to stimulate national economic development and regional economic integration, to raise revenue for operating the Government, and to encourage international trade. The report discusses Peru's import tariff system; taxes; documentation and fees; labeling, marking, and packing; and special customs provisions. Also covers non-tariff import controls, Peru's export controls, United States trade controls, and Government representation between the two countries.

PESTICIDES:

"Herbicides residue in seafood. Determination of butoxyethanol ester of 2, 4-dichlorophenoxyacetic acid in shellfish and fish," by J. E. Coakley, J. E. Campbell, and E. F. McFarren, article, Journal of Agricultural and Food Chemistry, vol. 12, May-June 1964, pp. 262-265, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

The Identification and Measurement of Chlorinated Hydrocarbon Pesticides in Surface Waters, by A. W. Breidenbach and others, Public Health Service Publication No. 1241, 119 pp., illus., processed, September 1964. Public Health Service, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.

"Pesticides get tangled in net of dead fish," article, Chemical Engineering, vol. 71, June 22, 1964, pp. 82, 84, 86, printed. McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York, N. Y. 10036.

Review of the Persistent Organochlorine Pesticides, Report by the Advisory Committee on Poisonous Substances Used in Agriculture and Food Storage, 67 pp., printed, 1964. Sales Section, British Information Services, 845 Third Ave., New York, N. Y., 10022.

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"Toxic effect of DDT on fishes," by D. S. Mathur, article, 31st Annual Session of the National Academy of Sciences of India, Dehra Dun, 1962, p. 76, printed, National Academy of Sciences of India, Bangalore, India.

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"Red blood values in the plaice (*Pleuronectes platessa*)," by A. Preston, article, *Chemical Abstracts*, vol. 58, March 4, 1963, 4844a, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

POLAND:

"Landings in fishing harbours," article, *Polish Maritime News*, vol. 7, no. 73, September 1964, p. 14, printed, Polish Chamber of Foreign Trade, Maritime Branch, ul. Pulaskiego 6, Gdynia, Poland. In 1963, 209,691 tons of fish were landed in Poland, of which 161,958 tons were landed at the chief fishing ports. Since 1961, there has been an increase in frozen fish, cod and ocean perch fillets, fish meal, and cod-liver oil in the landings. In the past 4 years the number of new trawlers at the ports listed increased; in 1963 Gdynia had 7 factory trawlers.

1000 Lat Naszego Rybolowstwa (1,000 Years of Our Fisheries), by Andrzej Ropelewski, 160 pp., illus., printed in Polish, 1963. Wydawnictwo Morskie, Gdynia, Poland.

Selected Articles, OTS 63-11401, 9 pp., processed, 1964, 50 cents. (Translated from the Polish, *Wiedomosci Parazytologiczne*, vol. 5, nos. 405, 1959, pp. 459-462; 463-465; 467-468.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Includes the following articles: "Parasitological problems in Polish fishery," by E. Grabda and J. Grabda; "Discussion at the session of the Fishery Parasitology Section;" and "Summary of the discussion at the meeting of the Section of General and Fishery Parasitology."

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Further Studies on the Introduced Asiatic Clam (*COR-BICULA*) in Tennessee, by Ralph M. Sinclair and Billy G. Isom, 82 pp., illus., processed, November 1963, distribution limited, State of Tennessee Stream Pollution Control Board, Cordell Hull Bldg., Nashville, Tenn. 37219.

"The pollution of water by detergents," article, *The OECD Observer*, no. 12, September 1964, pp. 38-39, illus., printed, single copy 50 cents. The Organisation for Economic Co-Operation and Development, Publications Office, 2, rue Andre-Pascal, Paris, (16^e), France.

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"Methionine supplementation of practical broiler rations. I--The value of added methionine in diets of varying fishmeal levels; II--The value of added methionine in chick starter rations," by S. Bornstein and Biana Lipstein, articles, *British Poultry Science*, vol. 5, May 1964, pp. 167-186, printed, Oliver and Boyd, Ltd., Tweeddale Court, 14 High St., Edinburgh 1, Scotland.

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"Essential amino acids, tyrosine and cystine, content of purified proteins of Bombay fish," by S. R. Mankikar and K. Sonnie, article, *Journal of the University of Bombay, Physical Science*, vol. 29, pts. 3 and 5 (nos. 48-49), 1960-61, pp. 82-85, printed, University of Bombay, Fort Bombay, India.

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"Pasteurization of fish by ionising radiation. A study of feasibility in the United Kingdom," by D. N. Rhodes, article, Irradiation des Aliments (Food Irradiation), vol. 4, no. 4, April-June 1964, pp. A8-A22, illus., processed. European Information Centre for Food Irradiation, P. O. Box No. 6, GIF-sur-Yvette (S.-et-O), France. It has been established on an experimental scale that packaged and irradiated fillets from 4-day-old fish will remain in first-class condition for between 10 and 20 days under the conditions likely to obtain in commercial practice. Such an extended storage life for fresh fish could be utilized in Britain to produce a much better commodity at the time of purchase by the consumer, especially in the inland centers of population. Such a process is likely to prove profitable to the fish trade because preparation and treatment would be centralized at the port of landing, and distribution arrangements could be made more efficient. The retailing of fish would be greatly affected by the introduction of clean and attractive packaging at standard weights, and sales promotion could be built up around a brand product. These factors combine in the concept of the irradiated product as presenting a new standard of quality in fish to the majority of consumers.

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gerlings in Lake Superior in June 1956; their subsequent spawning; and the landing of a few of their descendants in 1959 and 1961. "Those biologists who had studied it most closely had come to believe that the pink salmon was most unlikely to be able to live and reproduce successfully without residing for a time in a marine environment," states the author.

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El Salado de la Carne del Pescado--Un Metodo Sencillo y Economico para su Preservación (The Salting of Fish Flesh--A Simple and Economical Method for Its Preservation), by Leopoldo Navarro Galindo, 44 pp., illus., printed in Spanish, 1959. Direccion General de Pesca, Secretaria de Industria y Comercio, Mexico, D. F.

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L'Absorption du Sel et sa Diffusion dans la Conserve de Sardines a l'Huile (The Absorption of Salt and its Diffusion in Canned Sardines in Oil), by R. Meesmaecker and Y. Sohler, 8 pp., illus., printed. (Reprinted from Revue de la Conserve, April-May 1964.) Federation des Industries de la Conserve au Maroc, Laboratoire, 70, Allée des Jardins, Ain Zoren, Sebba, Morocco.

"Biological value of the proteins of fresh and canned sardines," by G. Varela, A. Pujol, and O. Moreiras-Varela, article, Anales de Bromatologia, vol. 15, no. 1, 1963, pp. 117-125, printed in Spanish. Sociedad Espanola de Bromatologia, Ciudad Universitaria, Edificio Facultad de Farmacia, Madrid, Spain.

SEA LAMPREY:

"The six hemoglobins of the sea lamprey (*Petromyzon marinus*)," by Nevenka M. Rumen and Warner E. Love, article, Archives of Biochemistry and Biophysics, vol. 103, October 1963, pp. 24-35, printed. Academic Press Inc., 111 Fifth Ave., New York, N. Y. 10003.

Synergism of 5, 2'-Dichloro-4'-Nitro-Salicylanilide and 3-Trifluoromethyl-4-Nitrophenol in a Selective Lamprey Larvicide, by John H. Howell, Technical Report No. 8, 31 pp., printed, 1964. Great Lakes Fishery Commission, Natural Resources Bldg., University of Michigan, Ann Arbor, Mich.

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An Evaluation of Existing Census Methods for the White Sea Harp Seal and Reflections on the State of the Stock, by Iu. I. Nazarenko and A. V. Iablokov, 9 pp., illus., printed, 1963. (Translated from the Russian, Zoologicheskii Zhurnal, vol. 41, 1962.) Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

Selfangsten 1962 (Seal Fishery 1962), Arsberetning Vedkommende Norges Fiskerier 1962, no. 10, 20 pp., printed in Norwegian, 1963. Norges Fiskerier, Fiskeridirektoren, Bergen, Norway.

SEAMANSHIP:

Dutton's Navigation and Piloting, edited by John C. Hill, II, Thomas F. Utegaard, and Gerard Riordan, 804 pp., illus., printed, June 1958, \$8. United States Naval Institute, Annapolis, Md. A teaching text for the basic elements of marine navigation used at the U. S. Naval Academy, this book is divided into three parts. Part 1, piloting, contains chapters on the earth and its coordinates; chart projections, portfolios, and inter-pretations; the sailings; instruments used by the navigator; dead reckoning; the gyro compass; the magnetic compass; aids to navigation; elements of piloting; current sailing and ocean currents; navigational publications; the piloting team; tactical characteristics in piloting; electronic navigation; and the practice of piloting. Part 2, celestial navigation, includes chapters on introduction to celestial navigation; celestial lines of position; solution of the navigational triangle; navigational astronomy; celestial equator system of coordinates; time; determining GHA and Dec. from the Nautical Almanac; establishing the navigational triangle; the marine sextant and its use; sextant altitude corrections; complete solution using H. O. Publ. No. 214 and the Nautical Almanac; the Air Almanac, H. O. 208, H. O. 211, and H. O. 249; compass error at sea; sunrise and sunset, twilight, moonrise and moonset; identification of celestial bodies; latitude and longitude observations; the practice of navigation at sea; polar navigation; and life-boat navigation. Part 3 covers relative movement and the maneuvering board. Included are a number of appendices covering summaries of terms and definitions; abbreviations, symbols, and labels, aids to solving problems in navigation; and other useful information.

Simplified Rules of the Nautical Road, by O. W. Will, III, 118 pp., illus., printed, 1963, \$2. United States Naval Institute, Annapolis, Md. Of value to anyone who owns or operates a boat, this booklet covers introduction to the rules, vessels approaching, lights and shapes, restricted visibility, and miscellaneous provisions. It also contains helpful hints, summary of sound signals, international rules, inland rules, pilot rules for inland waters, Motorboat Act of 1940, and condensed rules for preventing collisions.

SEA TROUT:

Scales Resorption and Spawning Marks in Sea Trout (SALMO TRUTTA L.) from Polish Waters (Resorpcja i Znaki Tarlowe lusez troci Salmo trutta L. z wod Polski), by Tadeusz Backiel and Roman Sych, OTS 61-11357, 39 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, Roczniki Nauk Rolniczych, vol. 73, ser. B, no. 2, 1958, pp. 119-148.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

SEAWEED:

"The seaweed industry in Great Britain," by E. Booth, article, Fishing News International, vol. 3, no. 3, July-September 1964, pp. 229-230, 233, illus., printed, single copy 6s. 6d. (about 90 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

The Seaweeds of Peru, by E. Yale Dawson, Cesar Aceto, and Ninja Foldvik, 1 vol., November 18, 1963. University of Southern California, Los Angeles, Calif.

SHARKS:

Cones in the Retina of the Lemon Shark (NEGAPRION BREVIROSTRIS), by S. H. Gruber, D. H. Hamasaki, and C. D. B. Bridges, Contribution No. 492, 4 pp., illus., printed. (Reprinted from Vision Research, vol. 3, 1963, pp. 397-399.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149.

Sound Perception in Elasmobranchs, by W. J. Wisby and others, Contribution No. 493, 14 pp., illus., printed. (Reprinted from Marine Bio-Acoustics--Proceedings of a Symposium Held at Bimini, Bahamas, April 1963, pp. 255-268.) Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149.

SHRIMP:

"The development and status of the pink shrimp fishery of Washington and Oregon," by Austin R. Magill, article, Pacific Marine Fisheries Commission Bulletin 6, 1963, pp. 62-80, printed. Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 SW 5th Ave., Portland 1, Oreg.

"Observations on some aspects of spoilage in fresh and frozen prawns," by V. Pillai and others, article, Indian Journal of Fisheries, vol. 8, October 1961, pp. 430-435, printed. Ministry of Food and Agriculture of Government of India, New Delhi, India.

"Preserving cooked, peeled shrimps," by Robert T. Roskam, article, Chemical Abstracts, vol. 59, July 8, 1963, 1031h, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Some Relations of Salinity to Population Distributions of Motile Estuarine Organisms, with Special Reference to Penaeid Shrimp, by Gordon Gunter, J. Y. Christmas, and R. Killebrew, 5 pp., printed. (Reprinted from Ecology, vol. 45, no. 1, Winter 1964, pp. 181-185.) Duke University Press, Box 6697, College Station, Durham, N. C.

SMOKED FISH:

"Content of 3, 4-benzopyrene in smoked saka, and in the smoke-soot of different methods of fish smoking," by N. D. Gorelova and others, article, Chemical Abstracts, vol. 59, September 16, 1963, 6905h, printed. The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

SOUTH AFRICA REPUBLIC:

Cape Times Fishing Supplement, October 20, 1964, 14 pp., illus., printed. Central News Agency Ltd., 130, Bree St., Cape Town, Republic of South Africa. Contains a review of the South African fishing industry by Clive Algar and includes articles on: "SA yards can make any fishing craft;" "They work for more efficient fishing;" "Fishermen look to science now;" "Million-ton catch--and SWA's share rises (pilchards);" "Steady market for fish meal;" "Stern trawlers--the latest in fishing;" "Rock lobster exports top R8m.--S. A. now produces 11m,

lb. every year;" "South Africans are now eating more fish;" "360 years ago the fishing industry started at Sandanha;" "Nearly R42m. sales to 60 markets;" "Cape has only one whaling station;" "Walvis Bay--mainstay of pelagic fishing;" and "Russian catch about 1m. tons a year."

"Larger laboratories help Institute to improve its services to industry," article, The South African Shipping News and Fishing Industry Review, vol. 19, no. 8, August 1964, pp. 105, 107, printed, single copy 30 cents (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. Discusses the 17th annual report of the Fishing Industry Research Institute, which outlines some of the more important technical and scientific services rendered to the South African and South West African fishing industry during 1963. A new addition to the laboratories on the grounds of the University of Cape Town was opened. Research was conducted in protein quality investigations, spontaneous heating of fish meal, fish protein concentrate extraction, fish frying methods, internal can corrosion, freezing and thawing of spiny lobsters, development of a fish cake mix, and the effects of fish meal and fish protein concentrate processing on their nutritional quality.

Seventeenth Annual Report of the Director, January-December 1963, 80 pp., illus., printed. Fishing Industry Research Institute, University of Cape Town, Rondebosch, Republic of South Africa. Discusses investigations conducted during 1963 in fresh and frozen fish, spiny lobster, fish smoking and frying, fish canning, tomato paste, fish meal and oil, clarification of sea water, spontaneous heating of fish meal, fish protein concentrate, nutrition and chemistry, and new products.

SPAIN:

Las Industrias de la Pesca y el Plan Nacional de Desarrollo (The Fisheries Industries and the National Development Plan), Estudio Sectorial No. 2, printed in Spanish. Sindicato Nacional de la Pesca, 18-20 Paseo del Prado, Madrid, Spain.

"El ano pesquero en la estadística" (The year's fishing in statistics), by Alevin, article, Industria Conservera, vol. 30, no. 301, July 1964, p. 179, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

"La situación actual del sector conservero" (The present situation in the canning industry), by Mareiro; "La profundidad de la crisis conservera" (The seriousness of the canning crisis), by Alevin; "La industria conservera Española en 1963" (The Spanish canning industry in 1963); "Gran contracción en nuestra industria conservera" (Great decline in our canning industry), article, Industria Conservera, vol. 30, no. 300, June 1964, pp. 145-146; 147; 155-156; 163, printed in Spanish.

SPECIES ASSOCIATION:

Species Association in Commercial Catches, by J. E. Paloheimo, Manuscript Report Series (Biological) No. 790, 2 pp., printed, 1964. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

storage industries, fisheries production in quantity and value, and quantity of supply and sales of fishery products and their average value at principal fish markets. Also includes data on processed marine products, fish culture area, production of fish fries, number of casualties of fishermen, losses and damage to fishing craft, and foreign trade in marine products. Most data are for 1963.

TERRITORIAL WATERS:

"Les droits de pêche français le long des côtes canadiennes" (The rights of the French fishery along the Canadian coasts), article, *La Pêche Maritime*, vol. 43, no. 1039, October 1964, pp. 711-712, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

TOXICITY:

"Biochemical studies on Minamata disease. III--Relations between the causal agent of the disease and the mercury compound in the shellfish with reference to their chemical behaviors; IV--Isolation and chemical identification of the mercury compound in the toxic shellfish with special reference to the causal agent of the disease," by M. Uchida, K. Hirakawa, and T. Inoue, articles, *Kumamoto Medical Journal*, vol. 14, 1961, pp. 171-179; pp. 181-187, printed. College of Medicine, Kumamoto University, Kumamoto, Japan.

"Origin of the causative agent of Minamata disease. I--Organic mercury compound in fish and shellfish from Minamata Bay," by K. Irukayama and others; II--Comparisons of the mercury compound in the shellfish from Minamata Bay with mercury compounds experimentally accumulated in the control shellfish," by K. Irukayama and others, articles, *Kumamoto Medical Journal*, vol. 14, 1961, pp. 157-169; vol. 15, 1962, pp. 1-12, printed.

TRADE LISTS:

The Bureau of International Business Operations, U. S. Department of Commerce, has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce Field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Philippines, 15 pp., July 1964. Lists the names and addresses, size of firms, and types of products (including fish and shrimp) handled by each firm.

TRAWLERS:

"Russian robot trawler," article, *Shipbuilding and Shipping Record*, vol. 102, no. 21, 1963, p. 667, printed. Shipbuilding and Shipping Record, 33 Tottenham St., Westminster, London SW1, England.

TRAWLING:

Measurement of the Characteristics of Fishing by Trawlers, by G. L. Kesteven and A. E. Stark, Reprint 537, 15 pp., processed, (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

More Profit in Midwater Trawling by Modern Echo-sounding, by Kurt Gaede, 5 pp., illus., printed, September 1964. (Reprinted from Fishing Gazette, August 15, 1964.) Brown & Ross, Inc., 17 Battery Pl., New York, N. Y. 10004.

Preliminary Bibliography on Trawlers and Trawling with Particular Reference to Tropical Waters, by A. Soulier, Occasional Paper 64/4, 14 pp., printed, 1964. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

"Trawling at increased speeds," by V. I. Kaplan, A. B. Lishin, and E. I. Zaitsev, article, *Rybnoe Khoziaistvo*, vol. 38, no. 5, 1962, pp. 30-44, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

TROPICAL FISHERIES:

"Problems associated with the development of fisheries in tropical countries. 2--The modernization of fishing methods," by R. C. Cole and L. H. Greenwood-Barton, article, *Tropical Science*, vol. 5, no. 4, 1963, pp. 215-247, illus., printed. Tropical Products Institute, 56/62 Grays Inn, London WC1, England.

TROUT:

"Fat oxidation and storage life of iced trout. II--The influence of sex and season," by Paul Hansen, article, *Journal of the Science of Food and Agriculture*, vol. 15, May 1964, pp. 344-348, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

Instructivo para la Cria de Trucha (Instructions for the Culture of Trout), by Rodolfo Ramirez Granados and Maria Luisa Sevilla Hernandez, 58 pp., illus., printed in Spanish, 1962. Instituto Nacional de Investigaciones Biologicas Pesquera, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

The Management of Reclaimed Trout Streams; Interim Report upon Federal Aid in Fish Restoration, by Frederic F. Fish, 13 pp., printed, 1963. North Carolina Wildlife Resources Commission, P. O. Box 2919, Raleigh, N. C.

"Recherches sur la composition cellulaire et chimique du sang de la truite arc en ciel d'eleveage (*Salmo gairdneri* Richardson)" (The cellular and chemical characteristics of blood of normal rainbow trout in commercial production--*Salmo gairdneri* Richardson), by P. Besse and A. M. Normand, article, *Bulletin de l'Academie Veterinaire de France*, vol. 36, no. 8, 1963, pp. 389-391, printed in French. Vigot Freres, Editeurs, 23 rue de l'Ecole-de-Medicine, Paris, France.

"Trout production and marketing in France," by Roland Bellet, article, *U. S. Trout News*, vol. 9, no. 3, September-October 1964, pp. 15-19, printed. U. S. Trout Farmers Association, 110 Social Hall Ave., Salt Lake City, Utah 84111. The French trout farming industry dates back to 1900. Today there are about 850 trout farms in France. Some are privately owned; about 50 are Government owned. The farms produce rainbow, brown, and brook trout. The food

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SPECIES IDENTIFICATION:

"Enolase: multiple molecular form in fish muscle," by Henry Tsuyuki and Finn Wold, article, Science, vol. 146, no. 3643, October 23, 1964, pp. 535-537, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Starch-gel electrophoresis showed three distinct molecular forms of enolase in each of eight different species of Salmonidae. The three enolases did not appear to be artifacts of isolation, and their electrophoretic patterns were completely reproducible. The patterns were also highly characteristic for each individual species of fish, and together with the overall myogen pattern they represented unequivocal means of taxonomical identification.

SPOILAGE:

"Biochemical and nutritional studies on East Pakistan fish. II--Assessment of dehydrogenase activity in fish tissue and investigation on the mechanism of fish spoilage by this new method," by M. Qudrat-i-Khuda, H. N. De, and N. A. Khan, article, Pakistan Journal of Scientific and Industrial Research, vol. 3, 1960, pp. 20-21, printed. Pakistan Council of Scientific and Industrial Research, 3/4/D/VI, Nazimabad, Karachi, Pakistan.

SPRAT:

Experimental-Industrial Preservation with Sodium Pyrosulfite of Caspian Sprat for Production of Feed Meal, by S. V. Yezerskiy, JPRS-24, 182, 23 pp., processed, April 14, 1964, 75 cents. (Translated from the Russian, Trudy Instituta Ikhtiologii i Rybnogo Khozyaystva Akademii Nauk Kazakhskoy SSR, vol. 4, 1963, pp. 211-233.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"On underwater observations of the behavior of sprats," by I. V. Nikonov, article, Rybnoe Khoziaistvo, vol. 38, no. 1, 1962, pp. 32-36, printed in Russian. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

STANDARDS:

"International standards and practices for fish and fishery products," by Rudolf Kreuzer, article, Fishing News International, vol. 3, no. 3, July-September 1964, pp. 265, 267-268, 270, printed, single copy 6s. 6d. (about 90 U. S. cents). Arthur J. Heighway Publications Ltd., Ludgate House, 110 Fleet St., London EC4, England.

STATISTICS:

Bulletin Statistique des Peches Maritimes, 1961 (Statistical Bulletin of Marine Fisheries, 1961), 54 pp., printed in French and English, 1964. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Charlottenlund, Denmark.

STURGEON:

Biologie et Exploitation des Esturgeons (Acipenserides) Caspiens (Biology and Utilization of the Caspian Sturgeons--Acipenserides), by Ismail Rostami, 210 pp., illus., printed in French, March 1961. Ahwaz Agricultural College, Molla Sani, Iran.

SUBMARINES FOR RESEARCH:

"Deep-diving craft as an aid to fisheries and oceanographic research," by A. E. F. Heydorn, article, The South African Shipping News and Fishing Industry Review, vol. 19, no. 9, September 1964, pp. 97, 99, 101, printed, single copy 30 cents (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. The answer to the problem of deep-sea oceanographic research lies in the provision of a submersible vehicle which can convey scientists to the depths to be explored in safety, in which breathing air is supplied at a pressure of one atmosphere and which can carry a power supply of sufficient capacity to provide driving power for the vehicle itself, for collecting devices, for cameras, and for illumination. Maneuverability and viewing facilities must be of a high order as prolonged observation of the sea-bed and its inhabitants is essential. Also the vehicle must not be too clumsy or heavy as it will have to be conveyed to research sites by surface vessels of moderate size. Types of vessels being used for research include the diving saucer, double-hulled craft such as the Alvin and the Deepstar, the Aluminaut, the Turtle, the mesoscaph, and the bathyscaph.

Deep Submergence Research, Report for Nov. 1, 1962-Dec. 31, 1963, 38 pp., printed, February 1964. Woods Hole Oceanographic Institution, Woods Hole, Mass.

"La estancia prolongada bajo el mar" (Living Under the Sea for Extended Periods), by Antonio Ribera, article, Iberica Actualidad Cientifica, vol. 42, nos. 25-26, July-August 1964, pp. 282-285, illus., printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Iberica Actualidad Cientifica, Apartado 759, Palau, 3, Barcelona 2, Spain. Discusses the underwater chamber developed for remaining under water for extended periods of time. Describes how 2 men lived in the vehicle for one week in June 1963.

SWITZERLAND:

Selling in Switzerland, by Jeannine Giffin and Alexander Dauman, OBR 64-108, 16 pp., printed, Sept. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Switzerland is one of the world's most active trading countries, and its economy is essentially free of government controls. The report covers the road to selling: import channels; import requirements; technical standards and requirements; patents; trademarks; distribution practices; and transportation, port, and storage facilities. Also gives details on commercial practices; marketing aids; Government procurement; United States export credit insurance and guarantees; and notes for business travelers.

TAIWAN:

Taiwan Fisheries Yearbook, 1964 Edition, 213 pp., illus., printed in Chinese and English. Taiwan Fisheries Bureau, Department of Agriculture and Forestry, Provincial Government of Taiwan, Taipei, Taiwan. Contains statistical tables on fishermen's organizations and membership, number of fishermen, status of fishing craft, status of ice-making and cold-

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generally used is dry pellets. The use of mechanized equipment on trout farms has aided the industry greatly. There is importation of live, frozen, and smoked trout, and trout eggs. Retail prices for round trout range from 90 cents to \$1.35 a pound for 5- to 7-oz. fish.

TUNA:

"Compte rendu des premiers essais de pêche au thon tropical à la senne du thonier sennear Danguy" (Report of the first trials in the tropical seine tuna fishery of the tuna seiner Danguy), by François Guicheney, article, La Pêche Maritime, vol. 43, no. 1039, October 1964, pp. 737-741, illus., printed in French, single copy 12 F (about US\$2.45). Les Editions Maritimes, 190 Blvd. Haussmann, Paris, France.

The Distribution, Biology and Fisheries of the Pacific Tunas (O Rasprostraneni, Biologii i Promysle Tikhookeanskikh Tuntsov), by V. G. Osipov, OTS 63-11118, 7 pp., processed, 1964, 50 cents. (Translated from the Russian, Trudy Soveshchaniia Ikhtiologicheskoi Komissii Akademii Nauk SSSR, no. 10, 1960, pp. 188-194.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Interdependence between the histamine and histidine content and organoleptic properties of tunny meat," by M. Ferencik and B. Havelka, article, Veterinarsky Casopis, vol. 11, 1962, pp. 384-391, printed in Czech. Kraj. Veter. Vysetr. Stanica, Bratislava, Czechoslovakia.

On the Number of Tuna Vessels or Aircraft Required to Search a Given Area Effectively, by J. S. Hynd, Reprint 539, 8 pp., illus., processed. (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

"Monthly and annual variation of catch rate shown in the 'self-navigation fishing vessel type' mothership tuna fisheries," by Jun Nakagome and Shigemichi Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, March 1964, pp. 234-238, printed. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

"Relation between annual variations of hooking rate and age groups of yellowfin tuna in the tropical western Pacific Ocean. I--Annual variation of hooking rate," by Jun Nakagome, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, December 1962, pp. 1164-1167, printed.

"Du thon tropical capture au filet tournant: les essais du Danguy" (On tropical tuna caught with a purse seine: the experiments by the Danguy), by M. Guicheney, article, France Pêche, no. 87, September 1964, pp. 21-26, illus., printed in French, single copy 2,5 F (about 50 U. S. cents). France Pêche, Boite Postale 179, Lorient, France.

TUNA AND MACKEREL:

"Lichinki skumbrievkyh ryb (Pisces, Scombriformes) iz Indiskogo Okeana" (Larvae of scombriform fish-

es--Pisces, Scombriformes--of the Indian Ocean), by N. N. Gorbunova, article, Trudy Instituta Okeanologii Akademii Nauk SSSR, vol. 62, 1963, pp. 68-95, printed in Russian. Izdatel'stvo Akademii Nauk SSSR, Moscow, U.S.S.R.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 12, no. 10, October 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on: "Synthetic filaments as utilized in the manufacture of fishing nets and ropes (Part II);" "The valuation of fish products in animal feeding and variations of product manufacturing process (Part II);" and "Observation of Ancona International Fishery Fair and Italy fisheries by technical points of view."

Selling in Turkey, OBR 64-97, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Turkey provides a sizable market for a wide variety of goods and services, with emphasis on capital goods that will help her achieve the aims of her five-year development program. The report discusses the road to selling: Turkey's import channels; import requirements; distribution; and transportation, port, and storage facilities. Also covers commercial practices, marketing aids, Government procurement, selling under United States programs, and notes for business travelers in Turkey.

UNITED ARAB REPUBLIC:

Market Factors in the U.A.R., OBR 64-117, 8 pp., printed, September 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Sales prospects in the state-controlled economy of the United Arab Republic are best for industrial and essential consumer goods. The report discusses scope and nature of the market--geography and population, consumer purchasing power, national income, sales and prices, and economic development; competitive factors--trade agreements, regional trade organizations, import and exchange controls, business practices, and United States share of overall market; and market analysis for selected commodities and services--agricultural products, industrial machinery, motor vehicles, petroleum, and agricultural machinery. Also included are statistical tables showing national income, 1950-63; wholesale price and cost of living indices, 1954-63; imports by country of origin and principal commodity groups 1962-63; and U. S. exports to U.A.R. by major product group, 1963.

UNITED KINGDOM:

Fisheries of Scotland Report for 1963, Cmnd. 2332, 128 pp., illus., printed, August 1964, 8s. 6d. (about US\$1.70). Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland. (For sale by Sales Section, British Information Services, 845 Third Avenue, New York, N. Y. 10022) Discusses principal accomplishments in the Scottish fisheries during 1963; means of capture and persons engaged--fishing fleet, number of fishermen, grants and loans to fishermen

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for purchase of vessels and gear; herring fisheries; white fish fisheries; shellfish fisheries; and miscellaneous items--byproducts production, and meteorological assistance. Also covers marine superintendence--coastal patrols, prosecutions for illegal trawling, seining, and other offenses, and Trawling in Prohibited Areas (Prevention) Act, 1909; salmon fisheries--catch, value and employment, closed seasons, district boards, poaching and illegal fishing, damage by seals to the fishery, and Committee on Scottish Salmon and Trout Fisheries; fisheries research projects; and harbors--grants and loans for harbor improvement, and dredging. Appendices present statistical tables and explanatory material on herring distribution and disposal of landings; herring landings by area; methods of capturing herring; and white fish--quantity and average price by species, fishing areas, landings by method and district, and foreign landing. Also included are information on salmon fisheries--annual closed seasons, details of catch, and report of Inspector; fisheries research--report of Director, and activities of Scottish Marine Biological Association laboratories; construction and improvement of harbors; and fisheries administration.

Torry Research Station Annual Report, 1963, on the Handling and Preservation of Fish and Fish Products, 56 pp., illus., printed, 1964, 90 cents. Department of Scientific and Industrial Research, State House, High Holborn, London WC1, England. (For sale by Sales Section, British Information Services, 845 Third Ave., New York, N. Y. 10022.) Describes accomplishments in research during 1963 on improvement in handling, treatment, and quality of wet fish; freezing and cold storage; smoke curing; canning; drying; salt-curing; and fishery byproducts. Also includes work in freeze-drying equipment, bacteriology of the production of fish meal and fish flour, lipids and protein denaturation, investigation of oxidative changes in the lipids of frozen white fish, and related subjects. Also contains a list of reports and papers published by Torry personnel during 1963 on the handling and preservation of fish and fishery products.

URUGUAY:

Revista del Instituto de Investigaciones Pesqueras, vol. I, no. 3, 1964, 109 pp., illus., printed in Spanish with English summaries. Instituto de Investigaciones Pesqueras, Facultad de Veterinaria, Alberto Lasplaces, 1550, Montevideo, Uruguay. Includes, among others, articles on: "El bio-proteocatenado de pescado en la alimentación humana" (The bio-proteocatenation of fish in human nutrition), by Victor H. Bertullo; "Estudios sobre el método de enfilado de pescado del Prof. Bertullo y Bach. Perez Hettich (Studies on the method of fish silage of Prof. Bertullo and Bach. Perez Hettich), by Pierre Beraud, Nestor Torres, and Saverio Marotta; and "La organización Universitaria de los Estudios de Biología Marina" (The University's organization of marine biological studies), by Enrique Rioja.

U. S. S. R.:

Marine Animals on Novaya Zemlya, by V. Antipin, Trans.-459, 3 pp., printed. (Translated from the Russian, *Sovetskaya Arktika*, no. 7, 1938, pp. 98-101.) U. S. Hydrographic Office, Washington, D. C.

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"Kristensen announces 77-foot fiberglass combination vessel," article, Fish Boat, vol. 9, April 1964, pp. 39-40, printed. H. L. Peace Publications, 624 Gravier St., New Orleans, La. 70150. Discusses a new 77-foot fiberglass vessel that, although designed with Alaska king crab operations in mind, is adaptable to many other types of fishing as well. Provisions have been made for a hydraulic pothauler to be mounted on the rail and for a hydraulic crane to be mounted on the forward hatch coaming, the latter to be used for transferring pots from the hauler to the loading hopper amidships. With this arrangement, the entire operation can be performed by two deckhands in full view of the helmsman in the afterwheel house so that the operation can be coordinated at all times. The deck was designed to be as clear of obstructions as possible so that a substantial number of pots can be stacked there. However, it is anticipated that collapsible pots, which are being developed, will eventually be stored in the forward hold, thus giving the vessel even greater capacity. Because the greatest cost of fiberglass construction is the mold, the architect has designed a boat to be used not only as a crabber but, with slight modifications, also as a dragger or as a halibut long-liner. In addition, the design is balanced so that the vessel can be built with the house forward for purse-seining. The pipe alley under the holds makes the pipe leads accessible to the crab tanks, fuel oil, fresh water, ballast tanks, and miscellaneous hydraulic equipment. The plan calls for four holding tanks amidships with a total capacity of about 5,000 king crabs.

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"Hydrogenation of whale oil to higher alcohols over a stationary catalyst," by D. B. Orechkin and others, article, Chemical Abstracts, vol. 58, April 15, 1963, 8152d, printed.

"Obtaining highly unsaturated alcohols by selective hydrogenation of sperm whale oil," by I. M. Tovbin and others, article, Chemical Abstracts, vol. 59, August 19, 1963, 4180b, printed.

"Sea hunt for specialties oils," article, Chemical Week, vol. 95, July 4, 1964, pp. 27-28, 30, 32, printed. McGraw-Hill Publishing Co., 330 W. 42nd St., New York, N. Y. 10036. Discusses the \$5 to \$8 million per year United States sperm whale oil industry. Sperm whale oil's unique chemical structure qualifies it as a plasticizer for some adhesive resins. At 15½ cents a pound, sperm whale oil is half the cost of any synthetic substitute. The present market for the 45° F. natural winter oil fraction is divided four ways. About 45 percent goes to oil or specialties firms that make extreme pressure lubricant additives for automatic transmission fluids; differential fluids; and other lubricants for automobiles, trucks, and aircraft. Twenty-five percent goes to the metalworking trade as a lubricant and additive for cutting oils, metal stamping, and drawing. Another 25 percent goes to leather processors as a prefabrication softening agent. The final 5 percent goes to textile mills as a spinning lubricant and to processing of the oils into fatty acids. A derivative of sperm whale oil, spermaceti, is used as an emollient in lipsticks and other cosmetics.

WHALES:

"Carboxymethylation of sperm whale metmyoglobin," by Leonard J. Banaszak and others, article, Journal of Biological Chemistry, vol. 238, October 1963, pp. 3307-3314, printed. Williams and Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, Md.

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Licence Limitation as Applied to Whaling, by R. G. Chittleborough, Reprint 534, 12 pp., illus., processed. (Reprinted from Fisheries Management Seminar, 1963, Report of Proceedings.) Division of Fisheries and Oceanography, Department of Primary Industry, Canberra, Australia.

CORRECTION

In the November 1964 issue, page 130, Our Freshwater Fishes (set of pictures), the address of the publisher was omitted. The address is R. E. Eshmeyer, 224 Elizabeth St., East Lansing, Mich. 48823.

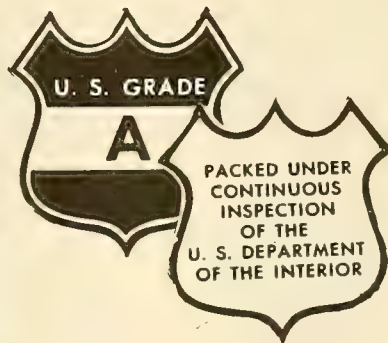


WHAT GOVERNMENT INSPECTION OF FISHERY PRODUCTS MEANS TO YOU

CONFIDENCE
IN
THE PRODUCT

ASSURANCE
OF
A QUALITY
PRODUCT

CONSISTENT
GOOD
QUALITY



TRAINED
GOVERNMENT
INSPECTORS

GRADE
"A"
QUALITY

QUICK
FROZEN

GOOD
FLAVOR

SANITARY
PACKING
CONDITIONS

SHRIMP FOR BREAKFAST

Shrimp-for-breakfast menus are legion in the South, particularly in the Carolinas where shrimp are purchased in the wee hours of the morning from peddlers who cry "Come and git yo' swimp." Shrimp Pies, unusual in that they have no crust, appear on a great many breakfast tables South of the Mason-Dixon line especially on Sunday morning. Elsewhere in the country where a breakfast is not complete without eggs, a Shrimp and Mushroom Omelet is much more satisfying, and a change of pace, too. The Shrimp Association of the Americas reminds us that it's also a grand way to start the day right, nutritionally speaking, since shrimp are rich in proteins, vitamins, and minerals. Complete the morning menu with fruit juice and warm rolls, and you'll be off to a head start.



SHRIMP AND MUSHROOM OMELET

12 ozs. fresh or frozen shrimp, or 1 package
(6 ozs. or 8 ozs.) peeled and deveined shrimp
6 eggs
3 tablespoons water
1 teaspoon salt
 $\frac{1}{4}$ teaspoon freshly ground pepper

$\frac{1}{4}$ pound butter, about
1 cup sliced fresh mushrooms (about six)
plus 3 or 4 mushroom caps
2 tablespoons minced onion
 $\frac{3}{4}$ cup bread cubes
3 tablespoons chili sauce, if desired

If shrimp are in shell, cook and clean them. Cleaned and deveined shrimp, if raw, need only cooking. If shrimp are large, cut in half lengthwise or chop coarsely. Set aside. Measure eggs, water, salt, and pepper into a bowl; set aside. Choose two skillets--a medium skillet for the filling and an omelet pan (heavy-gauge skillet) 10 or 11 inches in diameter. In filling skillet, melt one-third cup of butter. Add onion, shrimp, and mushroom caps and toss over moderate heat until browned. Transfer about half the shrimp and the mushroom caps to a warm bowl and hold for garnish. Add bread cubes to remaining shrimp in skillet and brown on all sides. Add sliced mushrooms (and a little more butter if needed) and cook and stir one minute more. Hold over very low heat while you make the omelet. Melt two tablespoons butter in the omelet pan and heat until bubbly, coating sides and entire bottom of pan. Beat eggs with fork or wire whisk until foamy. Pour all at once into pan and rotate and tilt pan to spread well. Lift edges of omelet with spatula and let uncooked top run underneath. Continue until surface stops running. If you like highly seasoned food, stir chili sauce into shrimp-mushroom mixture, then immediately spoon the mixture down the center third of the omelet. Tip pan slightly and use spatula to turn the third of omelet closest to handle over the filling. Next, with one motion, slide portion farthest from handle onto platter and flip folded portion over it to make three layers in all. Cover top with reserved shrimp and garnish with mushroom caps and parsley if desired. Makes 4 to 6 servings.

COMMERCIAL FISHERIES REVIEW

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Fishes



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FEBRUARY 1965

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

5/31/68

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EXPERIMENTAL TRAWLING FOR HIGH-SEAS SALMON

By Charles J. Hunter*

ABSTRACT

A large trawl, known as the "Cobb" Pelagic Trawl-Mark II, was tested near Adak, Alaska. Two Bureau of Commercial Fisheries research vessels were used in this experiment. One vessel fished the trawl to determine its capability to capture salmon on the high seas, and the other vessel fished gill nets to determine the availability of salmon.

Trawl catches were not large enough for research purposes, but further modification of the trawl may improve its efficiency.

The trawl catch consisted predominantly of small immature sockeye salmon. The gill nets, on the other hand, captured both small and large immature sockeye and chum salmon, but the catch consisted predominantly of large immature chums. When catches of small immature sockeye from both the trawl and gill nets were reduced to units-of-effort, the same trend in abundance was indicated by both types of gear.

Tows made at night and tows made in an easterly direction caught greater numbers of fish.

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INTRODUCTION

A large midwater trawl, referred to as the "Cobb" Pelagic Trawl-Mark II (McNeely 1963), is being developed by the U. S. Bureau of Commercial Fisheries.^{1/} The trawl is designed to sample all types of pelagic fish, and if successful in taking large quantities it will be used commercially. Some success has been achieved with this trawl in fishing for hake (Merluccius productus) off the coast of California, and large hauls of jack mackerel (Trachurus symmetricus) and dogfish (Squalus acanthias) have also been taken close to the Washington coast (McNeely 1963). A few salmon have been taken in test trials prior to this study, but the trawl had not been tested in an area, and at a time, when an abundance of salmon was known to be available.

During the past 8 years, floating gill nets and purse seines have been standard sampling gear used in capturing salmon on the high seas. Samples have been used for studying the distribution and abundance of salmon in the North Pacific Ocean and the Bering Sea. More recently long-lining has been used by the Canadians to capture salmon for tagging experiments (Neave, Manzer, Godfrey, LeBrasseur 1962). All three types of gear have been effective sampling tools, but a trawl should have advantages in certain situations for improving the sampling program. These would include (1) more rapid recovery of gear during adverse weather, (2) reduced cost of gear, and (3) greater flexibility in depth of fishing.

*Fishery Biologist (Research), Biological Laboratory, U. S. Bureau of Commercial Fisheries, Seattle, Wash.

^{1/}The "Cobb" Pelagic Trawl is under development by the Exploratory Fishing and Gear Research Base, Seattle, Wash. The Biological Laboratory, and the Exploratory Fishing and Gear Research Base, Seattle, Wash., cooperated in conducting the tests of the trawl reported here.

To evaluate the effectiveness of a midwater trawl for capturing salmon on the high seas, the "Cobb" pelagic trawl was tested during the month of August 1963 in an area south of Adak, Alaska. The area shown in figure 1 was chosen for the study because of the concentration of salmon known to be located along the southern side of the Aleutian Islands during the month

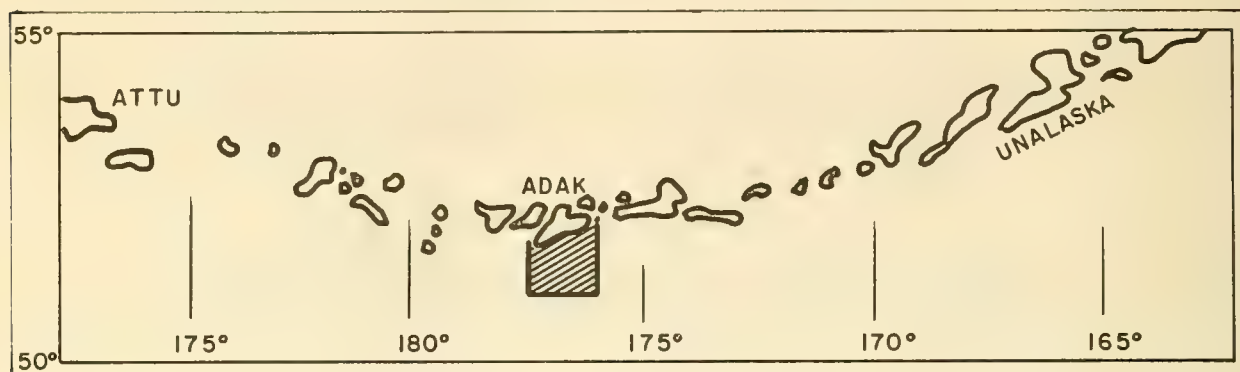


Fig. 1 - Area in which gill net-trawl study took place.

of August. By fishing in proximity to gill nets, it was possible to determine, to some extent, the availability of salmon to the trawl and to compare the fishing capabilities of the two types of gear. Other tests were conducted to study the relationship of direction of tow to catch, and the effects of daylight and darkness on the catch.

FISHING GEAR AND METHODS

The John N. Cobb (fig. 2), a 93-foot purse seine-type vessel (Ellson 1950), fished the pelagic trawl, and the George B. Kelez (fig. 3), a converted Navy light cargo vessel (French 1963), fished the gill nets.



Fig. 2 - The U. S. Bureau of Commercial Fisheries research vessel John N. Cobb hauling the pelagic trawl.



Fig. 3 - The U. S. Bureau of Commercial Fisheries research vessel George B. Kelez.

The gill net string (Larkins 1963a) was made up of 50-fathom shackles, 4 fathoms deep, and consisted of four mesh sizes of multifilament net: $5\frac{1}{4}$ -inch; $4\frac{1}{2}$ -inch; $3\frac{1}{4}$ -inch; and $2\frac{1}{2}$ -inch (fig. 4). In addition four experimental monofilament nets ($3\frac{1}{4}$ -inch and $4\frac{1}{2}$ -inch) were used but were not considered a part of this study. Usually, 18 shackles (fig. 4) of gill net were used, but when catches became inadequate 32 shackles were used to increase the sample size.

The length of the trawl (McNeely 1963) was 240 feet. The opening was estimated to be 75 feet wide and 90 feet high. It was constructed of 6-inch mesh in the wings, 3-inch mesh in the main body, and $3\frac{1}{4}$ -inch mesh in the cod-end (fig. 5). A $\frac{1}{2}$ -inch mesh liner (35 feet long) was used during the first 26 tows to retain the smaller marine animals. This liner was removed during the remaining tows to reduce clogging by jelly fish. During the first 26 tows, 51 Phillips trawl floats were used on the headline, but during the remaining 17 tows, 81 floats were used to increase the flotation of the headline.

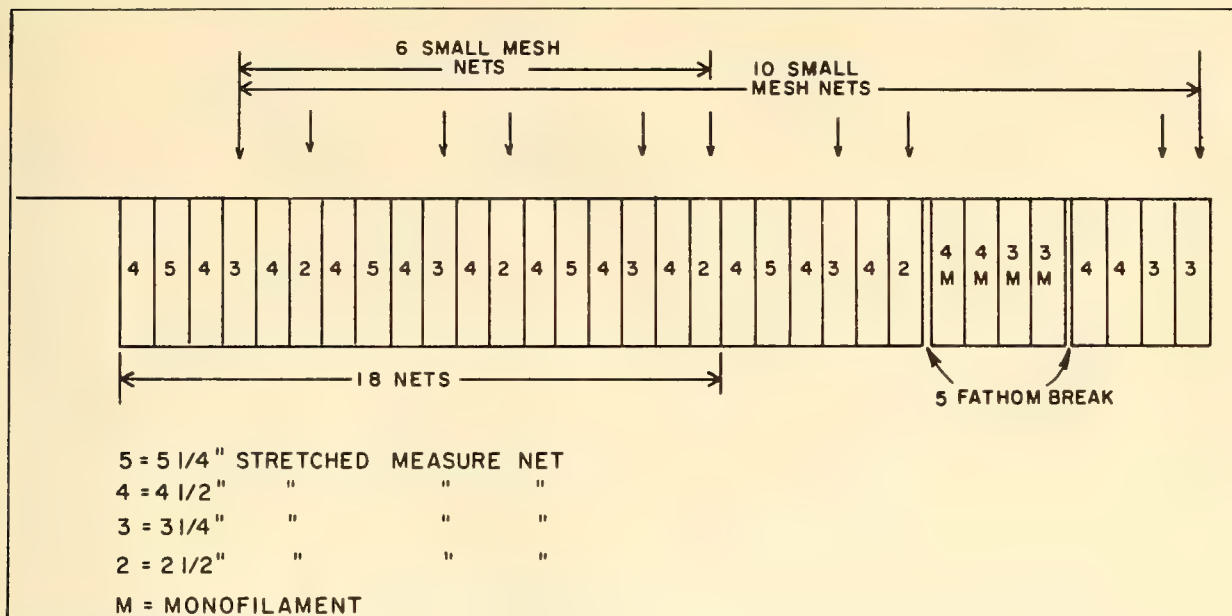


Fig. 4 - Gill net make-up for gill net-trawl study during the summer of 1963.

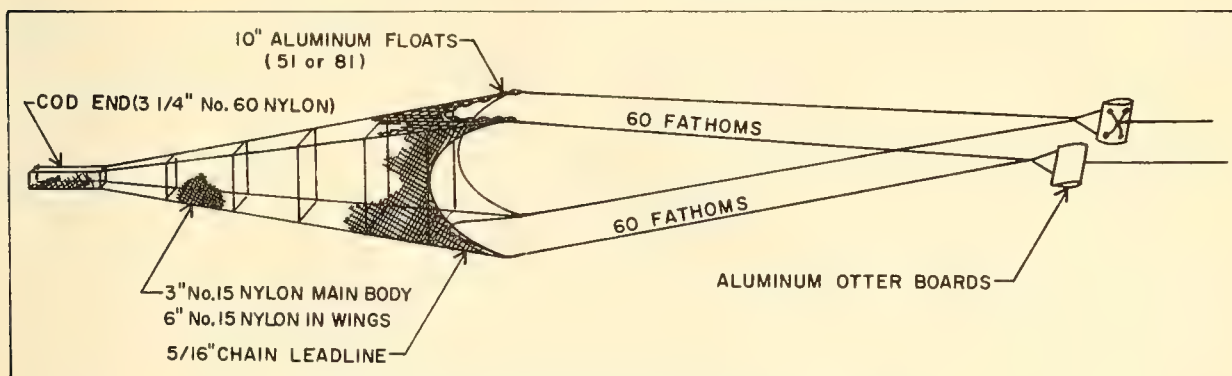


Fig. 5 - "Cobb" Pelagic Trawl-Mark II, showing method of rigging.

Four 1-hour tows in each 24-hour period were usually considered a day's fishing effort. Longer tows up to 4 hours were also made, but 1-hour tows appeared to produce about the same measure of success. Depending on the weather conditions, the number of tows-per-day ranged from 0 to 6. Although it was planned that at least one tow would be made toward east, south, west, and north each day, it was evident early in the cruise that this could not be accomplished because of adverse weather conditions. In general, tows were made as close as practicable to the gill-net positions (usually within 5 miles) with allowance for maneuverability of the vessel (figs. 6 and 7).

The experiment was programmed to use a minimum of 20 fishing days, but weather conditions permitted trawling on only 14 days. Four or more tows were possible during only 7 of the 14 days. This seriously limited the amount of information obtained.

Trawl and gill-net catches were analyzed by reducing each catch to a unit-of-effort. The catches were computed in numbers of fish caught per hour. Six small mesh nets (fig. 4) were used as the basis for determining unit-of-effort for gill-netting, since this was the number fished during most of the study.

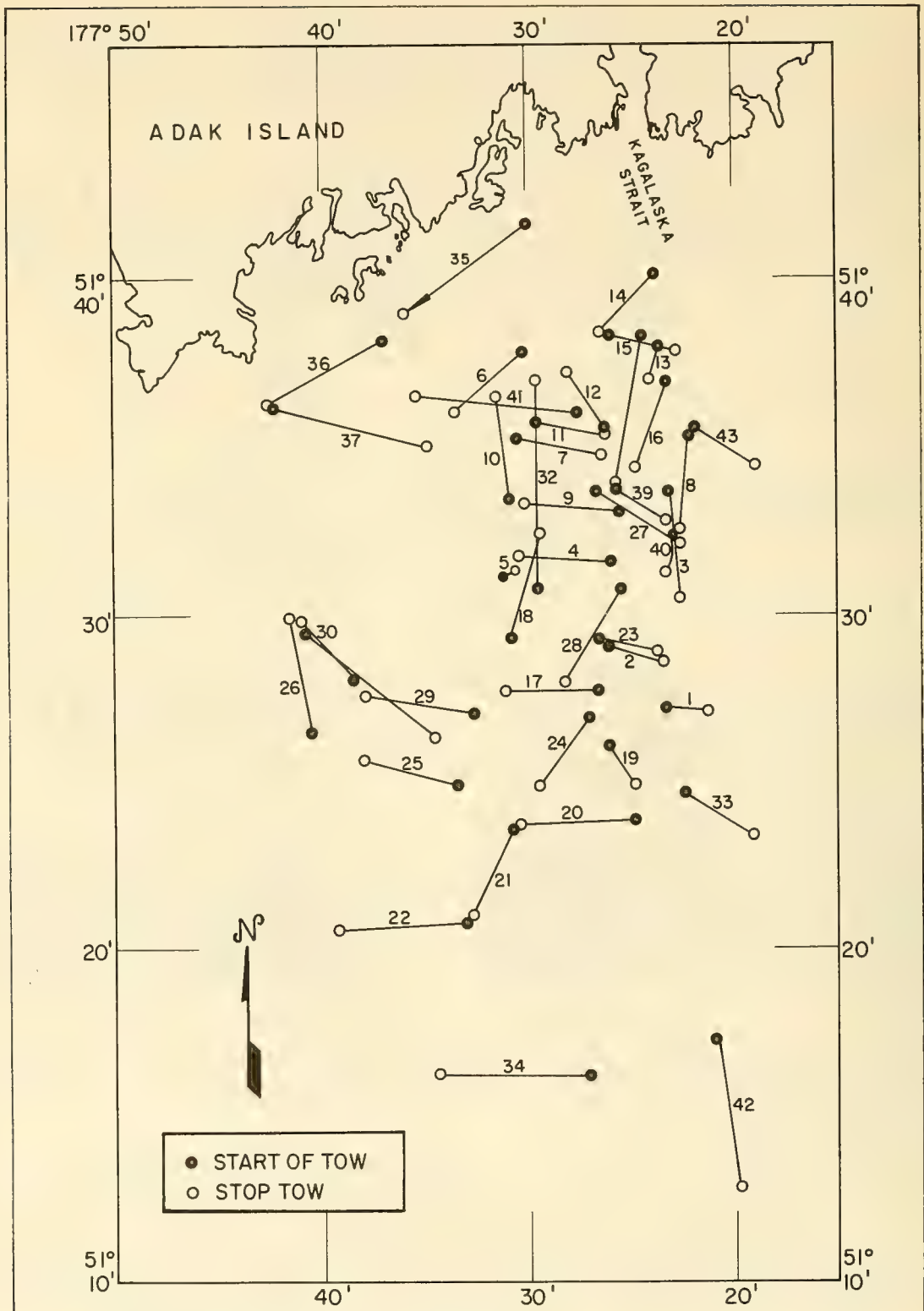


Fig. 6 - Location of tows made by the John N. Cobb using the "Cobb" Pelagic Trawl-Mark II during gill net-trawl study.

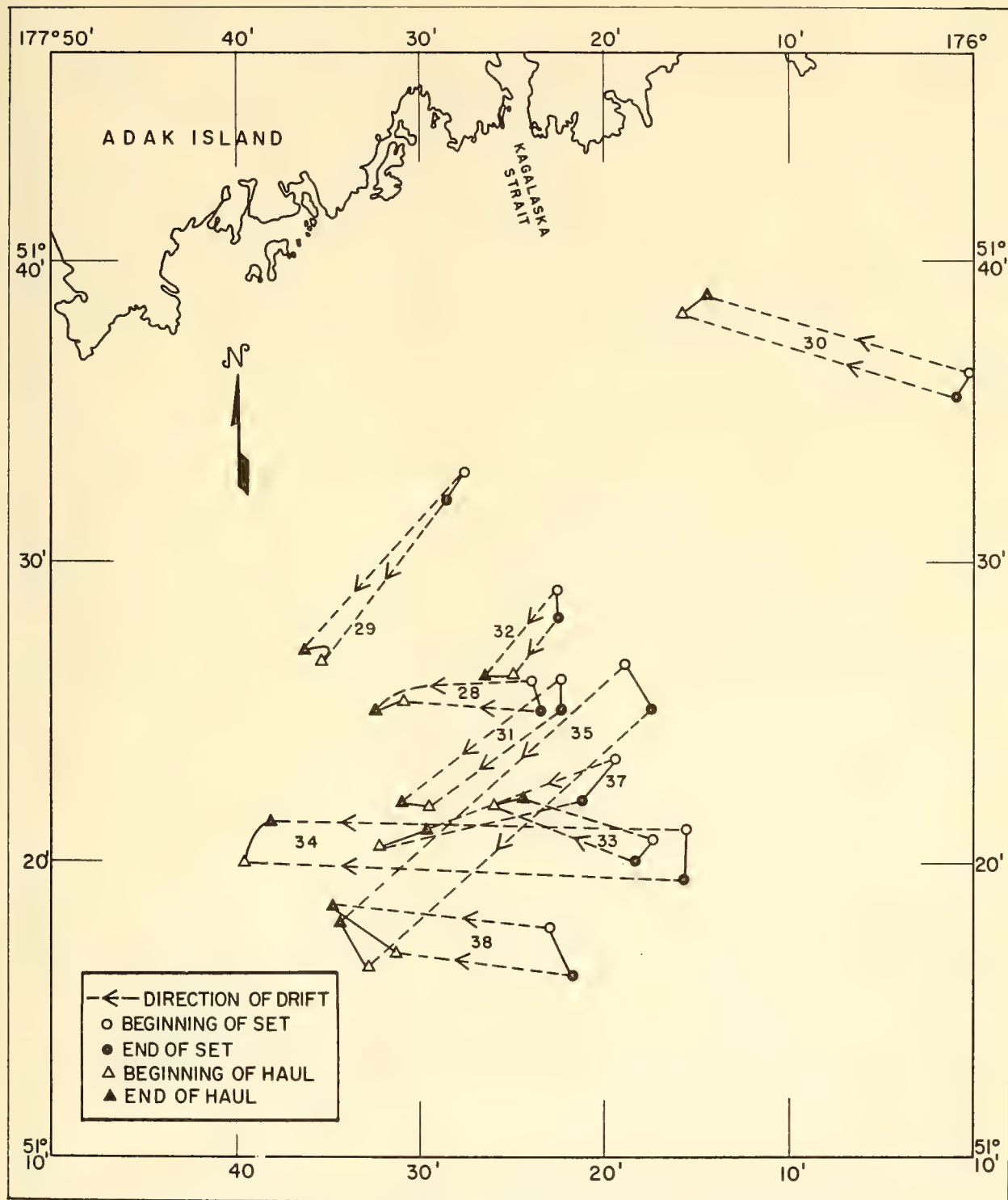


Fig. 7 - Location of gill-net sets made by the George B. Kelez during the gill net-trawl study.

RESULTS

Salmon catches at the 38 trawl stations consisted of 95 sockeye salmon (*Oncorhynchus nerka*) and 19 chum salmon (*Oncorhynchus keta*), making a total of 114 (table 1). The gill nets during the same period at 10 stations caught 686 sockeye, 800 chum, 6 pink salmon (*Oncorhynchus gorbuscha*), and 26 silver salmon (*Oncorhynchus kisutch*) for a total of 1,518 salmon.

Table 1 - Salmon Catches Made by the Trawl and Gill Nets During Sampling Study of the "Cobb" Pelagic Trawl-Mark II

Gear	Species	Total Catch	Percentage of Total Catch	Percentage of Small ¹ / _{of Total Catch}	Percentage of Small ¹ / _{by Species}
Trawl	Sockeye	95	83.3	82.4	98.9
	Chum	19	16.7	12.3	73.7
	Total	114	100.0		
Gill Nets	Sockeye	686	45.2	33.3	73.6
	Chum	800	52.7	14.5	27.6
	Pink	6	0.4	0.0	0.0
	Silver	26	1.7	0.06	3.8
	Total	1,518	100.0		

¹/Fork length under 420 mm.

Data regarding the catch from each type of gear may be compared from the following:

Item	Trawl	Gill Net
Species Composition:	(Percent)	
Sockeye	83.3	45.2
Chum	16.7	52.7
Pink	0.0	0.4
Silver	0.0	1.7
Total	100.0	100.0
Length:	(mm. (in.))	
Sockeye--range	305 to 426 mm. (12 to 16.8 in.)	292 to 640 mm. (11.5 to 25.2 in.)
" mean	354 mm. (13.9 in.)	404 mm. (15.9 in.)
Chum--range	350 to 513 mm. (13.8 to 20.2 in.)	285 to 638 mm. (11.2 to 25.1 in.)
" mean	406 mm. (16.0 in.)	476 mm. (18.7 in.)

Catches from both the trawl and gill nets consisted of small and large immature sockeye (1- and 2-, 3-, 4-winter-at-sea fish) and chum salmon (2- and 3-year and older fish). During the late summer, the separation point in size between the small and large immatures of both species is about 420 millimeters or 16.5 inches (fig. 8).

Length frequencies of the trawl catch demonstrated that the trawl was catching single ocean-age sockeye and principally single ocean-age chum salmon. Considerable numbers of those fish were gilled in the 3-inch mesh about midway in the trawl, indicating that the trawl was retaining some of the small fish in the meshes and that the larger fish were perhaps swimming out through the mouth.

Because of the preponderance of a single size, age, and species (small sockeye comprised 83.3 percent of the total trawl catch, table 1), this segment of the catch was used to compare the sampling capability of the two types of gear on small salmon. Figure 9 shows that catches taken by the two types of gear indicate about the same trend in abundance of small sockeye salmon in the area fished. Large sockeye were practically absent from the trawl catches, but they were well represented in the gill-net catches (fig. 8).

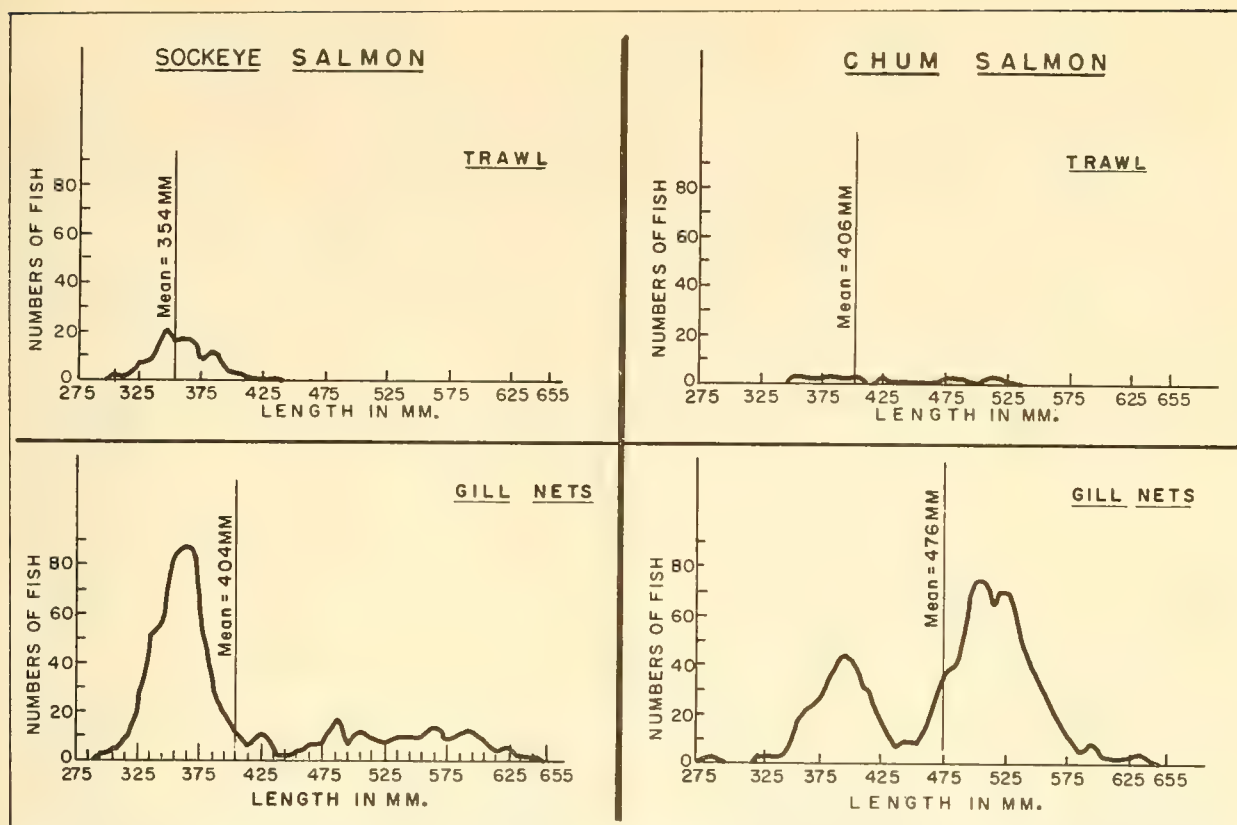


Fig. 8 - Comparison of length frequencies of salmon caught in the "Cobb" Pelagic Trawl-Mark II and gill nets during trawl and gill-net study.

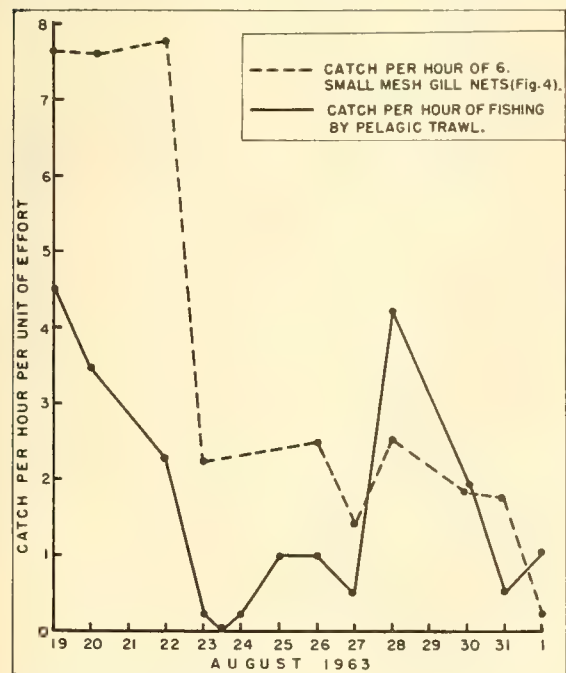


Fig. 9 - Comparison of trawl and gill-net catches of small immature sockeye salmon.

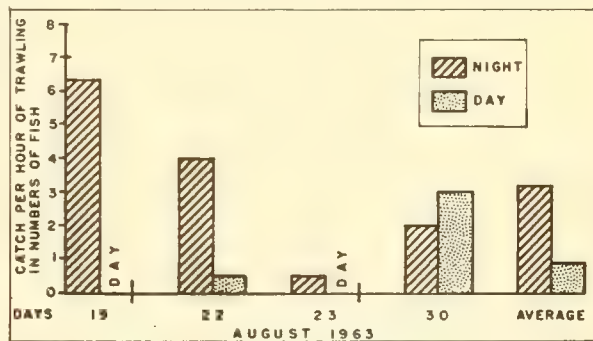


Fig. 10 - Comparison of trawl catches taken during hours of daylight and darkness. (Catches were compared when tows were made during both day and night.)

The percentage of small chum taken by the trawl was much greater than the percentage in the gill-net catches (table 1). The trawl caught 73.7 percent small chum while the gill nets caught 27.6 percent small chum. This difference further indicates that the trawl was more selective for small immature salmon.

Night tows were more productive than day tows during 3 of the 4 days when comparisons were possible. Usually more than three times

as many fish were caught per unit-of-effort at night than during the day (fig. 10). Past experience with gill nets has also shown that night fishing is more productive than day fishing.

Catches of individual tows were not consistently larger from any one direction, but the average catch from each direction did show that certain directions were more productive. The following are the average numbers of fish caught per hour for each direction: east 3.1; north 1.7; south 1.6; and west 1.2. These directions include all tows 45 degrees on either side of the given direction. The catches confirm the westerly movement of salmon in this area reported by Johnson (1963) and Larkins (1963b).

OTHER SPECIES

Many incidental species of marine animals were taken during this study (tables 2 and 3). Catches in the trawl occurred primarily before the fine-mesh liner was removed from the cod end.

Table 2 - Incidental Species of Marine Animals Taken in the Pelagic Trawl During Comparative Fishing Gear Study

Scientific Name	Common Name	Total Numbers	Fork	Length ^{1/}
			Mean	Range
<u>Pleurogrammus monopterygius</u>	Atka mackerel	219	125	100-160
<u>Zaprora silenus</u>	Prowfish	21	97	50-200
<u>Cololabis saira</u>	Pacific saury	187	210	185-260
<u>Eleginus gracilis</u>	Saffron cod	3,536	55	35-80
<u>Liparis</u>	Snailfish	1	55	-
<u>Electrona arctica</u>	Bigeye lanternfish	153	6	-
<u>Mallotus villosus</u>	Capelin	413	105	60-135
<u>Anarrhichthys ocellatus</u>	Wolf-eel	1	485	-
<u>Chauliodon macouni</u>	Fanged viperfish	35	No measurements	
<u>Atheresthes stomias</u>	Arrowtooth flounder	1	Do.	
<u>Brama rayi</u>	Pomfret	8	43	37-47
<u>Onychoteuthis banksii</u>	Squid	61	250	150-355
<u>Gonatopsis borealis</u>	Squid	228	70	20-180
<u>Moroteuthis robusta</u>	Squid	4	38	32-43
<u>Gonatus fabricii</u>	Squid	28	10	2-27
<u>Lampetra tridentata</u>	Pacific lamprey	1	38	-
<u>Callorhinus ursinus</u>	Fur seal	1	No measurements	

^{1/}Fork length measurements except for squid species (mantle length) and Pacific lamprey (total length).

RECOMMENDATIONS FOR FUTURE NET MODIFICATIONS

Soon after fishing commenced, it was apparent that trawl catches of salmon were not large enough for research on the distribution and abundance of salmon on the high seas. Gill-net catches indicated that ample numbers of salmon were available in the area. Some modifications to the trawl which may improve its usefulness as a sampling tool are as follows.

Table 3 - Incidental Species of Marine Animals Taken in Gill Nets During the Comparative Fishing Gear Study^{1/}

Scientific Name	Common Name	Total Numbers
<u>Pleurogrammus monopterygius</u>	Atka mackerel	4
<u>Cololabis saira</u>	Pacific saury	2
<u>Brama rayi</u>	Pomfret	15
Not identified for species	Squid	103
<u>Lampetra tridentata</u>	Pacific lamprey	1
<u>Salmo gairdneri</u>	Steelhead	30
Not identified for species	Herring	4
<u>Lamna ditropis</u>	Salmon shark	1
<u>Alopias superus</u>	Daggertooth	4
<u>Phocoenoides dalli</u>	Dall porpoise	2

^{1/}No lengths were taken of these specimens.

(1) Compress the depth of the opening of the trawl so as to sample a narrow surface layer of water which will reduce the drag of the net and allow an increase in speed.

(2) Reduce the length of the net to reduce drag, and possibly increase speed.

(3) Incorporate an electrical shocking device in the opening of the trawl to insure salmon do not escape. This loss was indicated by the large proportion of small salmon gilled in the meshes of the net and the predominance of small salmon in the total catch.

(4) Incorporate a fyke into the trawl to hinder salmon from swimming out of the net.

(5) Tow the trawl with 2 vessels, one on each side, to allow the trawl to pass through water undisturbed by action of the vessel.

CONCLUSIONS

Salmon catches by the "Cobb" Pelagic Trawl were not of sufficient numbers to be used as samples for research purposes. Catches of small immature sockeye salmon by the trawl and gill nets, however, indicated roughly the same trends in relative abundance. Other segments of the salmon population (large immature sockeye; large immature chum, and small immature chum) were not captured in sufficient numbers by the trawl to compare with gill-net catches.

In almost every case night tows were more productive than day tows. Also, tows made in an easterly direction were more productive than tows made in other directions.

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ESTIMATING RESIDUAL SHELL IN SHUCKED SOFT-SHELL CLAMS (*Mya arenaria* L.)^{1/}

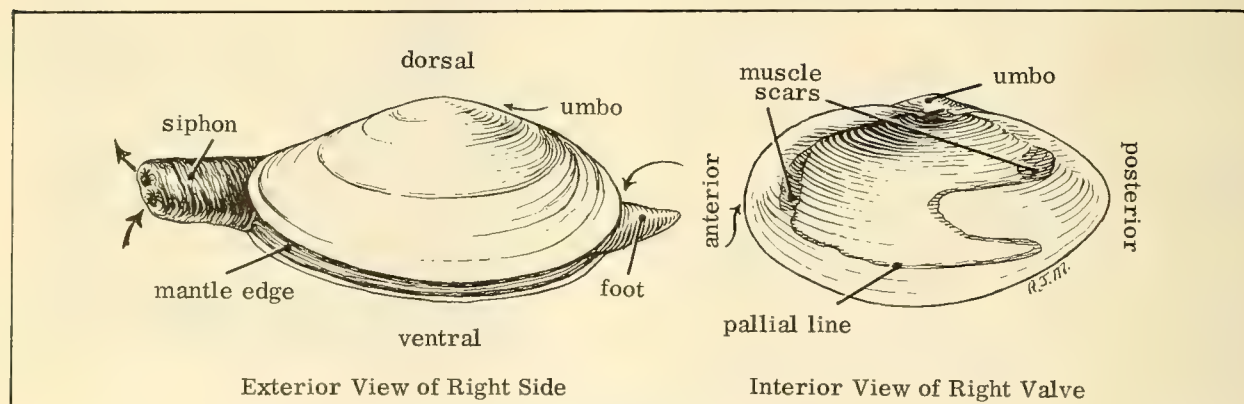
By Baruch Rosen* and Janice Freeman**

ABSTRACT

Residual shell in shucked soft-shell clams was estimated by an improved alkaline digestion method with an average recovery of 98 percent (range 96-102 percent). By using this method, a significant amount of shell can be removed from shucked soft-shell clams by manual sorting.

BACKGROUND

The soft-shell clam (*Mya arenaria* L.) industry has been increasing in importance to the fishery economy of Maryland the past ten years (Manning and Pfitzenmeyer 1958, Power 1958-1961). Both government and industry have shown interest in promoting higher consumption of soft-shell clams in Maryland and other areas. However, there is still consumer resistance to soft-shell clams. Much of this resistance is due to the presence of grit--i.e., sand and shell.



The soft-shell clam, *Mya arenaria* L.

Sources and mode of accumulation of sand differ from those of shell; consequently, different processing methods will be required for the removal of each. Before proceeding into the development of such methods, a valid and specific method for estimating the amount present of each fraction is highly desirable.

The following investigation was conducted to (1) find or modify a method (Anon. 1947) applicable for estimating the amount of shell present in shucked soft-shell clams and (2) measure the effect of manual sorting on the total amount of shell present in shucked clams.

For the purpose of this study, shell is defined as broken parts of the calcareous valve (mostly calcium carbonates and phosphates) of the mollusc that will be retained by a 14 x 18 mesh (number of strands per unit in length and width) galvanized iron screen. Because the shell of the soft-shell clam is fragile, the shucked meat is often contaminated with broken pieces of shell material through careless as well as normal handling.

^{1/}Contribution No. 276, Natural Resources Institute, University of Maryland. The work reported in this paper was supported in part by Area Redevelopment Administration Contract No. Cc6027.

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For the present purpose the shell residue present after shucking can be divided into two distinct groups: "splinters" and "fragments." The splinters are long thin pieces of shell with the long axis parallel to the line of growth. Their width varies from a fraction of a millimeter to 2 millimeters (0.08 inch) while their length ranges from 2 to 20 mm. (0.08-0.79 inch). The splinters result from fracturing the ventral edge of the shell when soft-shell clams are shucked by hand, as is the common practice (Hanks 1963).

Larger irregular masses of shell which vary in area from about 4 mm.² (0.16 in.²) to more than 400 mm.² (15.7 in.²) are designated as fragments. These originate from all areas of the shell including the umbo and muscle scars. The fragments result from fracturing the whole shells while in the hands of the shucker and subsequent dropping of shell fragments into the previously shucked clams.

The source of pieces of shell smaller than 4 mm.² can be best determined by association rather than by shape. Splinters smaller than 4 mm.² will adhere to the edge of the mantle even after digestion. Loose pieces are probably fragments.

METHODS AND MATERIALS

COLLECTION OF SAMPLE: Shucked soft-shell clams in one pint plug-top cans were obtained from commercial sources in Maryland.

REAGENTS AND APPARATUS: Sodium hydroxide reagent (Solution A) was made by dissolving 375 grams of reagent grade sodium hydroxide pellets in distilled water, cooling, and adjusting to one liter (0.26 gallon).

The phosphate reagent (Solution B) was made by dissolving 87.5 grams of reagent grade sodium orthophosphate dodeca hydrate ($\text{Na}_3\text{PO}_4 \cdot 12 \text{H}_2\text{O}$) in distilled water and adjusting to one liter.

Screens were fabricated from 4 x 4-inch squares of 14 x 18 mesh galvanized iron screen. The edges of the squares were soldered and then turned up to form a shallow dish.

One liter pyrex Erlenmeyer flasks covered with 250 ml. pyrex beakers were used as digestion flasks.

Other equipment included: autoclave, forced draft oven adjustable to $\pm 5^\circ \text{C}$. and 2 pairs of fine straight $4\frac{1}{2}$ -inch long forceps.

ANALYTICAL PROCEDURE: Clams from 8 pint cans (about 450 g. each) were combined and mixed; 200-gram portions of clams were weighed directly from the mixing container in-

to each digestion flask; 160 ml. of Solution A, and 40 ml. of Solution B were added to the digestion flask, which was then covered and autoclaved at 121°C . (15 p.s.i.g.) for 15 minutes. The flasks were kept hot in the autoclave and were removed one at a time for immediate analysis. The solution (hot corrosive gloves should be used) was poured onto a screen and washed with a mild stream of tap water. Any shell material that may have adhered to the flask was washed down. The shells were separated from other undigested material that remained on the screen and were placed on a second screen with forceps. The shells were then washed thoroughly with distilled water. The screen containing the washed shells was put in a preheated forced draft oven and dried for a half hour at 95°C ., cooled, and weighed. The shells were removed and the screen was tared. The actual weight of the shells was determined by the difference (table 1).

Table 1 - Amount of Shell Present in Shucked Soft-Shell Clams as Found by Alkaline Digestion

Sample No.	Weight of Clams		Weight of Shell
	Pints	Grams	Grams
6-18	4	1800 ^{1/}	1.89
6-24	4	1800	1.00
6-25	4	1800	1.05
7-1	4	1800	0.87
7-2	4	1800	0.98
7-8	4	1800	1.23
7-8a	4	1800	1.20
7-10	4	1800	3.18
7-10a	4	1800	2.95
7-15	4	1800	1.00
7-15a	4	1800	1.08
Average			1.49
Range			0.87-3.18

^{1/}Each sample is the combined result of nine 200-g. lots. See procedure.

RECOVERY AND CONTROL EXPERIMENTS: A recovery experiment was conducted in order to find the effect of the digestion mixture alone on the recovery of the shell material. The analytical procedure previously described was followed except distilled water (200 ml.) was substituted for the clams. A known amount of shell material was added to the digestion flask before digestion (table 2).

Table 2 - Recovery of Added Shell From Water Solution

Weight of Shell Added	Weight of Shell Recovered	Percentage of Shell Recovered
Grams	Grams	%
0.75	0.74	98.6
0.75	0.75	100.0
0.75	0.74	98.6
0.75	0.74	98.6
0.75	0.75	100.0
0.75	0.75	100.0
0.50	0.49	98.0
1.0	0.97	97.0
1.5	1.49	99.3
2.0	1.98	99.0
3.0	2.98	99.3
0.75	0.74	98.6
0.75	0.74	98.6
0.75	0.74	98.6
0.75	0.76	101.3
0.75	0.75	100.0
0.75	0.74	98.6
0.75	0.73	97.3
0.75	0.75	100.0
0.75	0.73	97.3
0.75	0.75	100.0
0.75	0.74	98.6
0.75	0.72	96.0
0.75	0.74	98.6
0.75	0.74	98.6
Average		98.8
Range		96-101.3

Table 4 - Effect of Visual-Manual Inspection of Total Shell Present in Shucked Soft-Shell Clams

Weight of Total Shell	Shell Found by Hand		Shell Found by Alkaline Digestion		
	Weight	Percentage	Weight	Percentage	
<u>Gram</u>	<u>Gram</u>	<u>%</u>	<u>Gram</u>	<u>%</u>	
0.23	0.21	91.3	0.02	8.7	
0.28	0.27	96.4	0.01	3.6	
0.22	0.18	81.8	0.04	18.2	
0.20	0.18	90.0	0.02	10.0	
0.37	0.33	89.2	0.04	10.8	
0.15	0.07	46.7	0.08	53.3	
0.11	0.06	54.5	0.05	45.5	
0.20	0.17	85.0	0.03	15.0	
0.34	0.27	79.4	0.07	20.6	
0.28	0.24	85.7	0.04	14.3	
0.94	0.88	93.6	0.06	6.4	
0.88	0.70	79.5	0.18	20.5	
0.29	0.17	58.6	0.12	41.4	
0.53	0.46	86.8	0.07	13.2	
0.40	0.35	87.5	0.05	12.5	
0.94	0.79	84.0	0.15	16.0	
0.91	0.80	87.9	0.11	12.1	
Average			81.1	Average	18.9
Range			46.7-96.4	Range	3.6-53.3

Another experiment was then conducted to find the combined effect of the clams and the digestion mixture on the recovery of the shell material. The analytical procedure first described was followed. However, before digestion, the clams were inspected several times thoroughly by a number of people, all shell found was removed by hand and with the help of forceps, and a known amount of shell was added to each flask (table 3).

In order to find the relative amount of shell which can be recovered by a thorough, though economically sensible, manual sorting, several lots of clams were obtained from commercial sources. These clams were inspected in the laboratory under conditions typical of better industrial practice, bringing into consideration economics of production as well as

quality of product. All shell removed was dried, weighed, and reported as shell found by hand. The analytical procedure first described was followed on the manually inspected clams. The total sum of shell found by hand and by alkaline digestion was assumed for the sake of calculation to be the total amount of shell present in the clams (table 4).

DISCUSSION AND CONCLUSION

Addition of phosphate salt to the digestion mixture gave consistently higher shell recoveries than digestion by sodium hydroxide alone. The digestion by the alkaline solution dissolved most of the clams except for epithelial tissues of the mantle and siphon. However, these did not interfere with the screening procedure or the subsequent picking of the shell. The period specified for digestion (15 min.) was sufficient. A longer period offered no advantage, since all added shell could be recovered after 15 minutes of digestion (table 3).

The choice of the specified type of screen was not arbitrary. It was found that this screen retained practically all shell particles while passing sand freely. This is important in view of the forestated difference between sand and shell. Continued subjection of the galvanized iron screens to the hot alkaline solution may cause a change in tare weight. (This may be prevented by using a more inert screening material.)

Recovery of added shell from both water and clams was statistically significant (t test). Because of the very small amount of undetected splinters that persisted in the clams even after thorough sorting, recovery in this case was higher than 100 percent (table 3). It was found that by careful, yet commercially feasible manual sorting, a significant amount of shell can be removed (t test); however, in each case an amount of residual splinters remained (table 4).

The alkaline digestion method described provides a fast and accurate way for estimating the total amount of residual shell in shucked soft-shell clams. Improvement in the methods for detection of shell and the development of commercial methods for elimination of shell in the shucked soft-shell clams are important to the further development and progress of this industry.

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SOUTH ATLANTIC OCEAN SEAMOUNT HOLDS KEY TO NEW STUDIES

Seamount Vema, a submerged volcanic peak rising to within 84 feet of the surface, lies 540 miles northwest of Cape Town in the South Atlantic Ocean. The unique scientific examination of the mount was carried out under the auspices of the National Committee for Oceanographic Research. It is reported that Seamount Vema is unique in that it is probably the only seamount known which rises from the floor of a deep ocean basin to a level sufficiently high for effective sunlight penetration and for study by SCUBA divers with normal equipment.

As an easily-located shoal area where ships may anchor in the center of the Cape basin, it is strategically placed as a reference point from which to carry out a variety of important scientific and fisheries research in an oceanic area of which little is known in spite of its great potential activity.

The rocks on the mount are covered with prolific and varied growth and rock lobsters were seen in great numbers. Those caught by hand and with a net were larger than the most common sizes encountered in the exploited populations of the South African west coast. (South African Digest, December 18, 1964.)

TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITIES OFF ALASKA:

U.S.S.R.: The Soviet trawl fleet in the Gulf of Alaska gradually decreased through October 1964 but began to increase in size again during the latter part of November 1964. In the previous season, the Soviet Gulf of Alaska trawl fishery terminated in mid-October 1963 and did not resume until mid-March 1964. Now the fishery appears to be developing into a year-round operation. Trawling was generally centered about 40 miles off Ocean Cape in the vicinity of Yakutat where about 25 vessels were operating by the end of November 1964. Observations showed the catch to be primarily Pacific ocean perch, with little or no incidental species being taken.

Two Soviet trawlers of a new type were fishing for shrimp during November 1964 in the vicinity of Two Headed Island off Kodiak. That was believed to be the first commercial exploitation of shrimp by the Soviets in the Gulf of Alaska.



One of the smaller Soviet trawlers fishing in the Gulf of Alaska.

Soviet whaling activity had terminated by the first week in November 1964 and all flotillas had returned to their Siberian bases.

Japan: The Japanese shrimp factoryship Chichibu Maru, accompanied by 10 trawlers,

was fishing north of the Pribilof Islands in the Bering Sea during November 1964.

A large new stern trawler, the Aso Maru, which fished for Pacific ocean perch in the western Aleutian area during late 1964 was scheduled to return to Japan about January 1, 1965.

Three large new stern trawlers, the Akebono Maru Nos. 71 and 72 and the Taiyo Maru No. 82 (the latter accompanied by the smaller trawler Choyo Maru) were reported to be operating in the eastern Bering Sea during November 1964.

* * * * *

GEAR-MARKING DEVICES TESTED:

Late in 1964, the U. S. Bureau of Commercial Fisheries research vessel John R. Manning participated in tests of gear-marking devices near Cape Spencer, Alaska. Nine different reflector buoys designed to be used in conjunction with shipboard radar were evaluated. Several buoys were lost or badly damaged in the severe tide, wind, and sea conditions encountered off the Cape. The tests eliminated a number of unsuitable designs and definitely established maximum and minimum ranges for two markers considered suitable for use under ocean conditions. Six sets (12) of the 2 satisfactory markers will be placed aboard king crab vessels in the Kodiak area for further testing and evaluation by the industry.

* * * * *

SHRIMP SURVEY OFF SOUTHEASTERN ALASKA:

A private fisheries firm has authorized a commercial fisherman to do about 4 months' exploratory fishing for shrimp with a 25-foot beam trawl early in 1965. The company apparently wants to locate sources of pink shrimp in southeastern Alaska for machine-processing either at Ketchikan or Waterfall.

A pink shrimp fishery would add needed diversification to that area.

* * * * *

HERRING FISHERY, 1964:

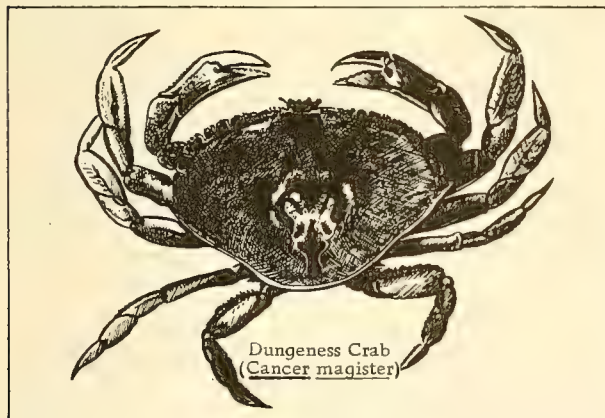
About 22,000 short tons of herring were processed in the 1964 southeastern Alaska summer reduction fishery. Age-composition studies revealed that no strong entering year-class was present and that over 70 percent of the herring were age VI or older.



California

DUNGENESS CRAB CATCH FORECAST, 1964/65 SEASON:

Northern California: A good season for commercial dungeness crab fishermen off northern California has been predicted in 1964/65 by the California Department of Fish and Game. Dungeness crab landings totaling 3.7 million pounds were forecast in northern California ports (Fort Bragg, Humboldt Bay, Trinidad, and Crescent City) during the 1964/65 season, as compared with landings of only 810,000 pounds in the previous season.



The number of legal-size crabs caught in random sampling in areas between false Cape and Crescent City led to the prediction for the 1964/65 season in northern California which opened December 15, 1964. The number of sublegal-size crabs caught (crabs between 6 and 7 inches in breadth) also was good, indicating that the 1965/66 crab fishery off northern California should be comparable to the current season.

Central California: Preseason sampling off central California led to a landings forecast of 750,000 pounds of dungeness crabs for the San Francisco Bay and Bodega Bay area in 1964/65, a substantial decline from the 1.2 million pounds landed in 1963/64. The Bay Area season opened November 10, 1964.

The preseason survey also turned up evidence that the crab fishery in central California probably will not improve in the 1965/66 season. That forecast is based on the small number of sublegal-size crabs caught in the sampling survey.

The preseason surveys were conducted with the California Department of Fish and Game research vessel N. B. Scofield.



Cans--Shipments for Fishery Products

January-October 1964: A total of 2,430,725 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-October 1964, a decrease of 5.8 percent from the 2,579,412 base boxes used during the same period in 1963.



January-September 1964: The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during January-September 1964 was down about 6 percent from that used during the same period of 1963. During the first 9 months of 1964 there was a decline in the pack of canned Maine sardines on the East Coast, canned shrimp on the Gulf Coast, and canned mackerel on the West Coast. The decline was partly offset by an increase in the Alaska salmon pack. The California canned tuna pack also showed a small increase in the first 9 months of 1964.

In January-September 1964, shipments to the Pacific or Western Area accounted for about 70 percent of total shipments; shipments to the Eastern Area accounted for about 26 percent; and shipments to the Southern Area accounted for most of the remain-

U.S. Domestic Shipments of Metal Cans for Fishery Products, Jan.-Sept. 1963 and 1964 ^{1/} (Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)								
Receiving Area	First Quarter		Second Quarter		Third Quarter		Jan.-Sept.	
	1964	1963	1964	1963	1964	1963	1964	1963
East ^{2/}	187,707	155,814	173,530	215,924	230,280	276,572	591,517	648,310
Southern	24,761	21,010	28,390	38,197	22,449	34,986	75,600	94,193
North Central	492	29	219	5	194	8	905	42
West ^{3/}	359,947	381,735	574,448	629,376	615,157	594,561	1,549,552	1,605,672
Total	572,907	558,588	776,587	883,502	868,080	906,127	2,217,574	2,348,217

^{1/}Preliminary.

^{2/}Includes Puerto Rico.

^{3/}Includes Alaska and Hawaii.

der. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 13,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

(2) See *Commercial Fisheries Review*, Jan. 1965 p. 19.



Canned Fishery Products

CANNERS CONVENTION MET IN SAN FRANCISCO, JANUARY 22-27, 1965:

The National Canners Association (NCA) held a Canners Convention in San Francisco, Calif., January 22-27, 1965. The preliminary program of the Convention listed the following events of particular interest to the fishing industry:

NCA-Bureau of Commercial Fisheries Conference (open session).

NCA Technical session #1--Fishery Products Program.

NCA Technical Session #6--Marketing Conference.

A National Exposition for Food Processors was held at Brooks Hall in the Civic Center. Many other events of general interest to canners were also scheduled.



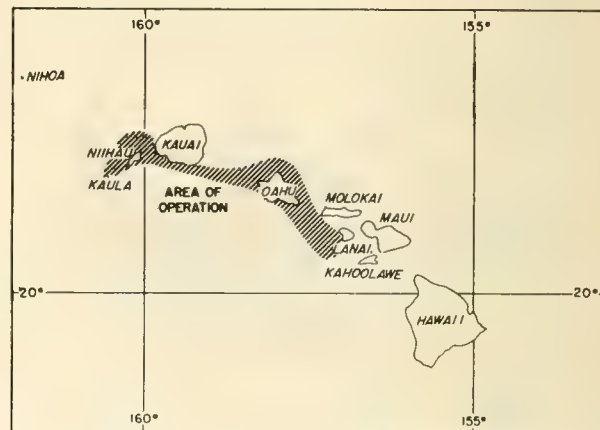
Central Pacific Fisheries Investigations

SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 77 (November 10-15, 1964): To collect biological

data on skipjack tuna (aku), which occur in the Hawaiian Islands during the summer and all but disappear during the fall and winter, was the principal objective of this 6-day cruise off the Hawaiian Islands by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii.

Skipjack tuna populations in the Pacific are divided into a number of reproductively isolated groups called subpopulations. At least two of those groups make up the skipjack catch of the Hawaiian pole-and-line fishing fleet. Those subpopulations can be identified by the blood type of the fish.



Area of operations for Charles H. Gilbert during Cruise 77 (November 10-15, 1964).

During cruise 77, the Charles H. Gilbert took a total of 109 skipjack bloods for population studies from the single school that was successfully fished. The skipjack were taken off the Island of Niihau. Technical difficulties made serum collection impossible.

A total of 87 volume samples of skipjack blood also were collected. The sex of each fish yielding a large volume of blood was determined making a total of 87 skipjack for which blood type and sex can be coordinated.

Twelve snouts and 12 kidney sections of fresh skipjack were collected and preserved for biological study.

The following sightings of bird flocks with fish schools were recorded: skipjack schools 6; unidentified fish 2; bird flock but no signs of fish 3; porpoise 1; and mahimahi 1.

No yellowfin tuna schools were spotted.

Bathythermograph (BT) casts at 270 meters (886 feet) and surface salinity samples were taken every 3 hours when practical and after each successful fishing effort.

Drift cards were released at the time of each BT and at 1-hour intervals along the windward coasts of Oahu and Niihau.

Note: See Commercial Fisheries Review, Jan. 1965 p. 22.

* * * * *

TRADE WIND ZONE OCEANOGRAPHIC STUDIES CONTINUED:

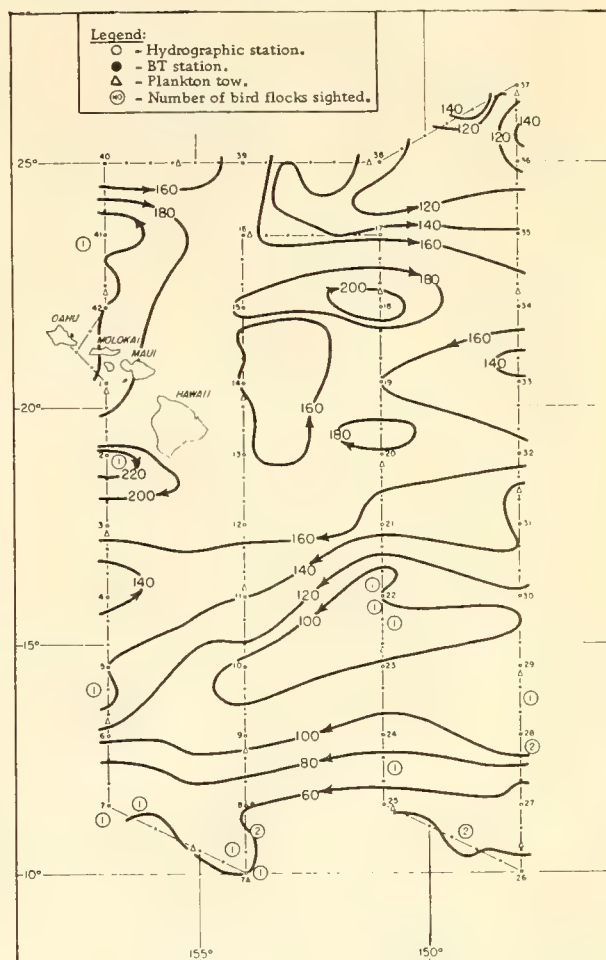
M/V "Townsend Cromwell" Cruise 10 (November 4-24, 1964): This was the ninth in a series of monthly cruises by the research vessel Townsend Cromwell aimed at finding out more about water layers in the trade wind zone of the North Pacific Ocean. Fishermen as well as biologists benefit from this work by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, Hawaii.

The skipjack catch by Hawaiian fishermen is affected by seasonal movements of surface water types. Similarly, movements of deeper water mass boundaries may also affect the availability of skipjack to the Hawaiian fishery. Such water movements may also affect the availability of other fishery resources.

The study in the trade wind zone is dealing with three major layers of water in the upper 1,500 meters (4,920 feet): the surface water, the subsurface high salinity layer, and the deeper low salinity layer. In low latitudes those 3 water layers may lie within the upper 300 meters (984 feet) of ocean and may be within the upper 150 meters (492 feet) as in the vicinity of latitude 10° N., and therefore are well within the depths where fish are harvested.

Previous studies have shown that the surface-water-type boundary between the high salinity North Pacific Central water and that of the North Pacific Equatorial water moves

seasonally. Data from the present series of cruises confirm the earlier findings. Movements in the boundary of the subsurface high-salinity layer were suspected, but no time-sequence oceanographic data were available to demonstrate such movements. The Townsend Cromwell data now show very pronounced boundary displacements in that layer. Such displacements, although less extensive, are also apparent in the deeper low salinity layer.



Cruise track chart of M/V Townsend Cromwell, Cruise 10 (November 4-24, 1964), showing depth contours of the 20° C. isotherm in meters.

During the November 1964 cruise of the Townsend Cromwell, data were collected in the area bounded by latitudes 10° N. to 27° N. and longitudes 148° W. to 158° W. A total of 43 oceanographic stations were occupied along the cruise track (see chart). At each station temperatures and samples for salinity analysis were obtained at 18 or 20 different depths down to 1,500 meters (4,920 feet).

Deep casts down to 4,000 meters (13,120 feet) to sample 4 other levels were made at stations 7A, 21, 26, 31, and 39. At station 31, an additional sample was taken at 5,000 meters (16,400 feet), but the thermometers were broken by apparent implosion.

The November 1964 surface circulation pattern indicated further change from the summer to the winter pattern. Some features from September and October 1964 were still recognizable, though modified in position and form. The large tonguelike feature which had been north of the Hawaiian Islands appeared to have broken off into an eddy and moved eastward and increased its radial velocity. The eddy found previously just east of the Islands had remained in nearly the same spot and decreased in speed. In addition, eddies appeared to have developed at 19° N. and 16° N. along 157° W., and near 15° N. between 148° W. and 155° W. The westerly flow in the southern region had extended farther north and decreased in velocity.

An overall cooling was noted in the surface waters in November 1964. Between October and November 1964, temperatures decreased by nearly 2° C. in the north and over 1° C. in the south.

Eighteen flocks of birds associated with fish schools were sighted which contrasted with 28 in September and 63 in October 1964.

Bathythermograms (BT) were obtained at 30-mile intervals along the cruise track; casts were made at 10-mile intervals between stations 2 and 4, 17 and 19, and between stations 23 and 25.

Other operations included: (1) obtaining surface bucket temperatures and water samples for salinity analysis at each BT observation; (2) making dissolved oxygen determinations from each water sample collected at stations 7A to 16, 26 to 37, and at 39; (3) taking water samples for dissolved inorganic phosphate analysis; (4) releasing 10 plastic-enclosed drift cards at hourly intervals the first 12 hours and the last 9 hours of the cruise and at 30-mile BT observations throughout the rest of the cruise; (5) making daily plankton tows; and (6) taking radiation measurements from the sun and sky.

These monthly oceanographic cruises in the trade wind zone are a pilot study which is scheduled to continue through June 1965 and

so provide the necessary data to begin analysis of the nature and significance of the water mass movements.

Note: See Commercial Fisheries Review, Jan. 1965 p. 23.



Clams

PROGRESS REPORT OF 1964 SURF CLAM SURVEY OFF ATLANTIC COAST:

A progress report on a surf or sea clam survey made in 1964 off the Atlantic coast, conducted jointly by the Oyster Institute of North America and the U. S. Bureau of Commercial Fisheries, was issued in the fall of 1964 by the Bureau's Regional Office, Gloucester, Mass. The survey was first started in the summer of 1963 and resumed in 1964, with field work completed on September 24, 1964. The work done during 1964 was to determine the commercial clam dredging potential of an area designated as survey area V. Survey operations during 1963 were conducted in areas designated as Areas I and IV (off New Jersey, Delaware, and Maryland).

The results of the 1964 surf clam survey as contained in the progress report follow:

Area V is off the coast of Maryland and Virginia just south of Area IV. The northwest corner lies about 15 miles southeast of Ocean City, Md., at $39^{\circ}9'$ N. latitude and $74^{\circ}49'$ W. longitude; the north boundary follows the 1H4-3050 loran line southeasterly from that point, out to the 25-fathom contour. The east boundary follows that contour line south to the $37^{\circ}10'$ N. latitude, roughly paralleling the west boundary which follows the 1H5-3080 loran line from the $37^{\circ}25'$ to $39^{\circ}9'$ N. latitude. The south boundary lies along the 2450-1H4 loran line between the 25 fathom contour line and the $37^{\circ}10'$ parallel. The size of the area is about 900 square miles; the water depth varies from about 50 to 150 feet. The composition of the bottom varies from very hard sandy types to soft mud and clay.

Survey Procedure: Operations followed the same procedure as those used in areas I and IV which were surveyed during the summer of 1963. All sampling stations within the area were located by loran bearings and spaced so that each station occurred about one mile apart. A 40-inch jet-dredge

of the type presently used by the industry was used for taking samples at each survey station.

The clam sounder rigged with two hydrophones was again attached directly to the dredge for use in sounding for shells between stations. The dredge was towed between stations with the pump shut down and the sounder on; when reaching a sampling area, water was pumped to the jets, and after the blade had dug in, a 5-minute tow was made. The catch was then taken aboard for analysis.

Survey operations were started in the northwest section of the area and expanded to the south and east, until at the end of field work, about 30 percent of the area had been covered. Sampling stations were therefore located in both deep and shallow water sections of the survey area and samples were taken from a variety of different bottom soil types that were present in the surveyed area. The best catches of surf clams were made in bottom soils of gravel or soft sand, in water depths from 85 feet to 120 feet.

Yields and Sizes: The largest yield of surf clams from any one station was 10 bushels, but only 9 tows were made where no clams were taken. Most of those 9 tows were made in the deeper offshore waters where the black quahog made up the bulk of the catch. The

Catch of Surf Clams and Black Quahogs, with Bearing and Depth Recordings, for Those Stations Where the Yield Was One or More Bushels of Surf Clams Per Tow

Station Number	Loran Bearing		Depth of Water (In Feet)	Bushels	
	1 H 4	1 H 5		Surf Clams	Black Quahogs
2-29	2714	3076	90	3.0	0.0
3-15	2882	3072	90	1.1	0.0
4-24	2774	3068	87	2.3	3 1/2
6-14	2894	3060	96	1.2	0.0
6-15	2882	3060	96	1.5	0.0
6-17	2858	3060	102	1.7	0.0
6-22	2798	3060	108	10.0	0.0
7-12	2918	3056	99	1.6	0.0
7-22	2798	3056	84	1.6	0.0
8-16	2870	3052	99	1.4	0.0
8-17	2846	3052	98	2.0	0.0
8-25	2762	3052	90	1.0	0.0
8-36	2630	3052	93	2.3	0.0
9-2	3038	3048	102	1.6	0.0
9-19	2834	3048	102	1.9	1 1/2
10-12	2918	3044	102	1.5	1 1/2
10-14	2894	3044	114	3.6	5 1/2
10-16	2870	3044	105	2.8	7 1/2
10-18	2846	3044	105	1.2	1 1/2

1/Number of black quahogs per tow.

predominant size group found throughout the areas were those in the 5 3/4- to 6 1/2-inch size range. At some of the stations, however, surf clams in the smaller size groups outnumbered

those in the mature classes. Those stations were located in areas close to heavy populations of mature clams. The second predominant size class were those in the 1 1/2 to 2 1/2-inch group; with those clams in between the two ranges occurring in less amounts. Very few clams under 1 inch in length were taken, probably due to the inability of the gear to catch them.

The smallest clam taken was 3/8-inch long and the largest measured a little over 7 1/8 inches. In the area of greatest population density the mature clams taken would average somewhat smaller in size than those taken in the less densely populated areas.

Relative Densities of Clam Populations:

Generally the area where the greatest density of clams occurred was that section running from the center of the area's western side northeasterly to a point about 15 miles south of the northern boundary. The tows that produced the greatest number of clams were made within that area where softer types of

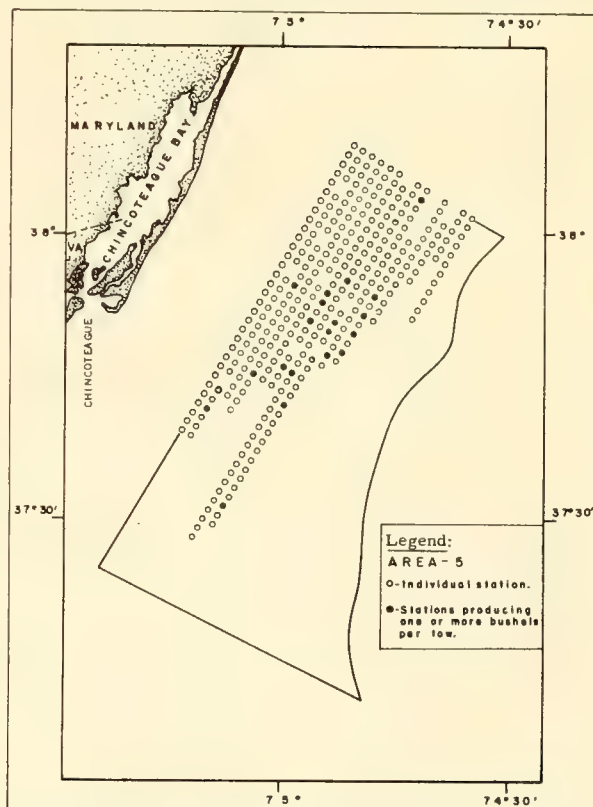


Fig. 1 - Survey Area V showing sampling positions on 1-mile grid pattern. Blacked in stations produced one bushel or more of surf clams in a 5-minute jet-dredge tow.

bottoms were found. North of that the bottom was generally very hard, and south the bottom was very hard with large patches of clay and mud.

Surf clam shells were taken at most of the sampling stations in quantities ranging from 1 or 2 individuals to over 10 bushels.

Very few black quahogs were found along with the surf clams in the best producing clam areas. They did occur in considerable numbers off in the deeper waters where the number of surf clams per tow were few or none at all. The black quahog occurred in those areas in quantities from 3 individuals to a little over 3 bushels. Thus the pattern of distribution appears to be about the same as that found in those areas surveyed in 1963.

The potentiality of that area for future commercial surf clam dredging appears to be the best of any area so far surveyed. There is at present a population of clams of varying density covering almost the entire surveyed area. Within those areas, where the densities of the clam is the greatest, one should be able to make sizable tows. The other areas of lesser densities will not at present support profitable dredging with present fishing gear. At some later date if those populations increase in size or if more efficient gear is developed they could become a good source of the surf clam for commercial dredging.

Continuation of Survey: With the appropriation of money by Congress for a sea clam research project during fiscal year ending June 30, 1965, additional survey work has been scheduled for the late winter and spring of 1965. Two 33-day cruises by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware are planned for the first 6 months of calendar year 1965, and a third 30- to 40-day period of operation is planned for the second half of 1965. It is anticipated that the Bureau's new research vessel Delaware II will be delivered and in operation for continuation of sea clam explorations in 1966 and succeeding years.

Plans are to complete the survey of the presently designated areas I through V before moving into new areas; also production-type fishing is planned for the most promising areas found, to more fully determine the commercial potential of such locations.

Clam Sounder: Gear research for the current and next fiscal year (1965 and 1966) will be concentrated on the fullest development of the clam sounder. Trials and improvements already effected indicate that the device can quite possibly be developed into a sophisticated and accurate research tool. Ultimately it is hoped that this or a similar device can be used to give an objective and dependable index of the abundance of surf clams and/or black quahog (identified by species) available in a given survey area. Such an instrument would greatly facilitate both the speed and accuracy of survey operations. Commercial application would take much of the guesswork and random searching out of the operation.



Fig. 2 - Shows surf clam fishermen sorting clams from shells and other debris taken in jet-dredge catch aboard a commercial fishing vessel.

Future Utilization: Looking toward the future, and supposing that new unexplored beds are located along with better means of harvesting the sea clams, some thought must be given by all concerned to the conservation of that species if the sea clam industry wants to maintain a profitable operation in the coming years. These years of research work should not be aimed towards locating vast beds of sea clams to be utilized by the industry on an unmanaged basis, but rather toward wise commercial utilization that will maintain this clam at a constant high of production.

Note: See Commercial Fisheries Review, November 1964 p. 41; November 1963 p. 28.



Crab

CHESAPEAKE BAY WINTER CATCH MAY BE AFFECTED BY UNUSUALLY WARM WEATHER:

Good weather may mean poor winter crab fishing in Chesapeake Bay, according to the head of shellfish research at the Virginia Institute of Marine Science, Gloucester Point.

The scientist reported large numbers of crabs in Chesapeake Bay in late 1964, even though dredge catches were somewhat erratic. "When water temperatures are above 48° F. one can expect crabs to be feeding and moving about actively," he said. "On the other hand, when the water temperature falls below 46° F, crabs become sluggish, and generally stay put. . . ."

The marine scientist indicated that water temperatures in early December 1964 had not fallen low enough in Chesapeake Bay to halt crab activity. Under the circumstances, crab dredges could make large catches one day, yet upon returning to the same location the following day the watermen might discover that most of the crabs had moved to another location.

Chesapeake water temperatures in the first part of December 1964 were about 4 degrees warmer than the average during the past 6 years. As a result, the crabs which normally stop in the middle of the Bay continued to move farther south. "What we don't know is

where the crabs will eventually bed down when cold weather halts their migration," the shellfish expert said. Some may stop in the region from Lynnhaven to Cape Charles. Others may move into ocean waters before the cold reaches them, and there they will become less available to crab fishermen. (Virginia Institute of Marine Science, December 21, 1964.)



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-NOVEMBER 1964:

Fresh and Frozen: Purchases of fresh and frozen fishery products in November 1964 for the use of the Armed Forces were down 12 percent in quantity but only 5 percent in value from the previous month. In November 1964, purchases were down for shrimp, oysters, and most fish fillet items, with the exception of haddock fillets. Prices for shellfish items moved up sharply in November 1964.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, November 1964 with Comparisons

QUANTITY				VALUE			
Nov.	Jan.	Nov.	Jan.	Nov.	Jan.	Nov.	Jan.
1964	1963	1964	1963	1964	1963	1964	1963
(1,000 Lbs.)				(\$1,000)			
1,970	2,232	24,300	21,722	1,409	1,206	13,712	12,123

Table 2 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, November 1964 with Comparisons

Product	November				Jan. -Nov.	
	1964		1963		1964	1963
	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Quantity Pounds
Shrimp:						
Raw headless	96,150	97	1/	1/	1,200,550	1/
Peeled and deveined	240,288	133	1/	1/	1,559,324	1/
Breaded	341,550	88	1/	1/	3,860,770	1/
Molded and breaded	26,300	64	1/	1/	447,620	-
Total shrimp	704,288	104	894,321	69	7,068,264	6,576,065
Scallops	165,200	72	220,975	57	2,587,550	2,384,182
Oysters:						
Eastern	63,340	110	1/	1/	770,881	1/
Pacific	26,396	74	1/	1/	319,078	1/
Total oysters	89,736	100	148,705	89	1,089,959	1,133,930
Clams	12,630	35	35,600	29	235,983	254,742
Fillets:						
Cod	23,400	33	45,731	30	476,616	612,156
Flounder	161,800	31	136,050	27	2,858,452	2,750,977
Haddock	114,760	33	163,560	39	1,766,314	2,012,936
Ocean perch	259,250	29	361,510	31	3,319,970	3,540,351
Haddock portions	131,500	49	-	-	571,322	-
Steaks:						
Halibut	73,950	48	139,047	37	1,206,277	1,333,220
Salmon	21,110	72	13,326	62	249,555	177,076
Swordfish	3,761	58	5,460	52	15,171	31,208

1/Breakdown not available.

Compared with the same month in the previous year, purchases in November 1964 were down 12 percent in quantity, but up 17 percent in value. Average prices were much higher for shrimp and scallops in November 1964. Prices were also up for most of the other items purchased with the exception of ocean perch fillets and haddock fillets.

Total purchases in the first 11 months of 1964 were up 12 percent in quantity and 13 percent in value from those in the same period of the previous year. Purchases of shrimp and scallops showed the largest increase. There was some decline in purchases of oysters, cod fillets, ocean perch fillets, halibut steaks, and swordfish steaks.

Canned: Tuna was the main canned fish item purchased by the Department of Defense in November 1964. In the first 11 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines)

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, November 1964 with Comparisons

Product	QUANTITY				VALUE			
	Nov.		Jan.-Nov.		Nov.		Jan.-Nov.	
	1964	1963	1964	1963	1964	1963	1964	1963
	(1,000 Lbs.)				(\$1,000)			
Tuna	251	1,011	5,069	4,003	108	416	2,244	1,836
Salmon	1	732	2,750	2,210	1	433	1,631	1,328
Sardine	8	59	301	458	2	22	174	180

were up 22 percent in quantity and 21 percent in value from the same period of 1963 due to larger purchases of canned tuna and salmon.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See *Commercial Fisheries Review*, Jan. 1965 p. 27.



Great Lakes Fisheries Explorations and Gear Development

LAKE SUPERIOR TRAWLING STUDIES CONTINUED:

M/V "Kaho" Cruise 23 (November 8-December 12, 1964): Finding improved ways of catching and handling Lake Superior commercial fish was the main aim of this cruise in Lake Superior from Whitefish Bay to the Keweenaw Peninsula. This was the last of three 1964 cruises for that purpose by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Kaho. Bottom trawls were used in the survey.

Highlights of the three cruises were: (1) finding new trawlable grounds; (2) taking con-

sistently good catches of chub at certain depths during each cruise; (3) recording fish schools (probably mostly chub) by depth-sounder in areas not being fished by commercial fishermen; and (4) catching species such as smelt and suckers in some drags.

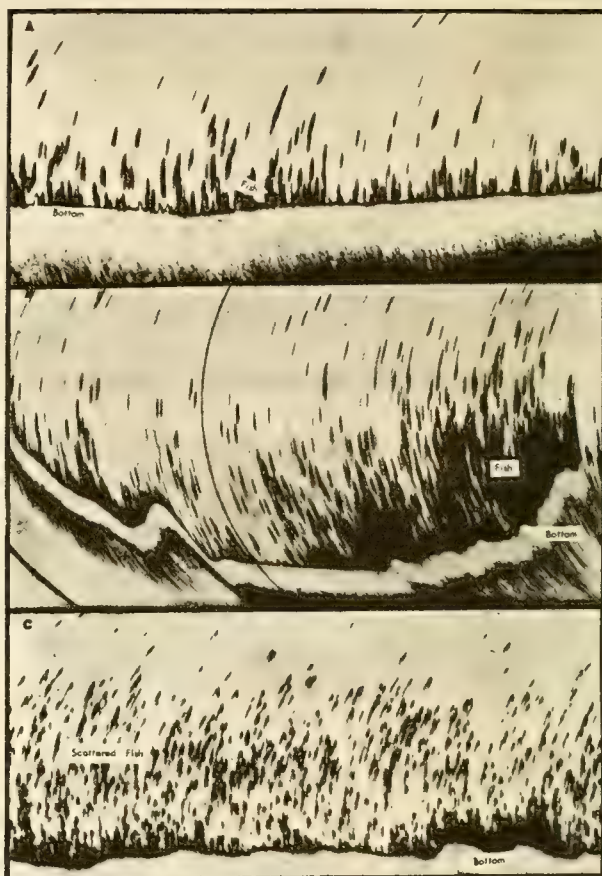


Fig. 1 - Echograms from a high resolution echo-sounder during M/V Kaho cruise 23 showing bottom profile, fish near the bottom, and at midwater depths. A--Echogram made in Whitefish Bay: distance traveled 2 statute miles, depth 35 fathoms, time 9:30 a.m. B--Echogram made off Munising: distance traveled 2.5 statute miles, depth 25-38 fathoms, time 7:40 p.m. C--Echogram made off Keweenaw Bay: distance traveled 2 statute miles, depth 50 fathoms, time 9:00 a.m.

The chub catch rate was good. It would appear practical to trawl for chub even at the relatively low ex-vessel prices offered by the animal-food market. But the chub taken in trawls were of good size and quality so they would bring fishermen much more money on the smoked fish or fillet market.

The primary aim of Kaho cruise 23 was to: (1) determine the seasonal availability of various species of fish to bottom trawls, and (2) locate new areas suitable for trawl-

ing. During cruise 23, the Kaho also: (1) conducted preliminary trials with a midwater trawl and a new high-opening bottom trawl; (2) tested a new type of underwater television system; (3) collected length-frequency data on chub, herring, and alewife; (4) collected

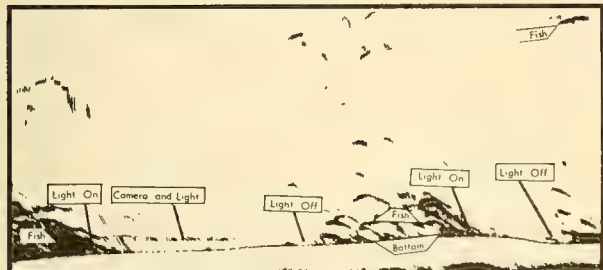


Fig. 2 - Echogram made with a high resolution echo-sounder during underwater television and light trials. Note that fish move away from lighted area while lamp is turned on and return when lamp is turned off. Depth 42 fathoms. Time 9:00 p.m.

water samples for limnological studies; and (5) collected chub samples for studies on improved processing methods.

Commercially significant catches of chub were taken in the Whitefish Bay area, Shelter Bay near Munising, off Marquette, east of the Keweenaw Peninsula between Grand Traverse Bay and Bete Gris Bay, and in Keweenaw Bay. Catches of cisco were insignificant throughout all areas fished. Good catches of smelt were taken in Whitefish Bay, Keweenaw Bay, and Shelter Bay. Significant catches of common whitefish were obtained in Munising Bay, Huron Bay, and Keweenaw Bay. Two drags in Huron Bay yielded sizable catches of common suckers.

Additional areas suitable for trawling were located south of Manitou Island, in Keweenaw



Fig. 3 - Lake Superior explorations (Munising to Keweenaw Peninsula), M/V Kaho cruise 23.

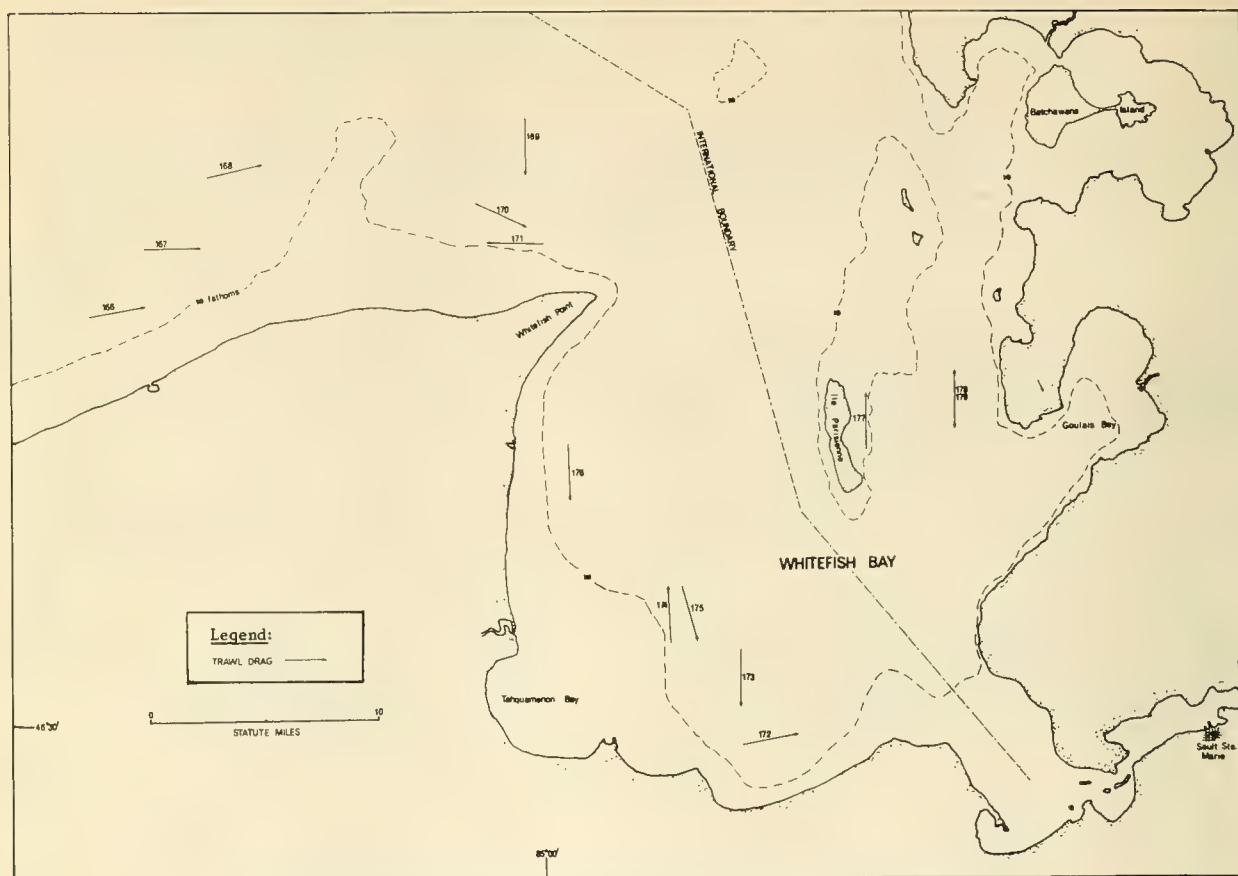


Fig. 4 - Lake Superior explorations (Whitefish Bay Area), M/V Kaho cruise 23.

Bay, east of Ile Parisienne in Whitefish Bay and off Big Bay in the open lake.

Dense concentrations of fish on the bottom and at midwater levels were located by depth sounding in several areas monitored during the cruise (fig. 1). Results of tests with the underwater television system in Lake Superior dramatically illustrated the usefulness of the unit as a research tool. At 45 fathoms the television camera showed the repelling effect of a high-intensity, mercury-vapor lamp on fish concentrated near the bottom at night (fig. 2).

FISHING OPERATIONS: Trawl drags during the cruise totaled 64--including 59 with a 52-foot (headrope) Gulf of Mexico-type fish trawl, 2 with a 40-foot midwater trawl, and 3 with a 70-foot modified wing trawl. Of the 59 standard exploratory drags, 45 were made in the primary area of investigation between Munising and Keweenaw Peninsula (fig. 3) and 14 in the Whitefish Bay area (fig. 4). All

drags lasted 30 minutes except 6 which were stopped early due to bad bottom conditions. Snags caused severe trawl damage during 3 drags and minor damage during 6 other drags.

FISHING RESULTS: Munising to Keweenaw Bay: Good catches of chub ranging from 210 to 620 pounds per drag were taken off Shelter Bay at 49-51 fathoms, off Marquette at 45-47 fathoms, east of the Keweenaw Peninsula between Grand Traverse Bay and Bete Grise Bay at 35 to 55 fathoms, and in Keweenaw Bay at 30 to 50 fathoms. Over 75 percent (by weight) of all chub caught were over 9 inches in length. Good catches of smelt, ranging from 100 to 150 pounds were taken at 49 to 51 fathoms off Shelter Bay and in Keweenaw Bay at 30 to 40 fathoms.

Cisco were taken in only small quantities in all areas monitored. Catches of common whitefish, up to 39 pounds per drag, were taken in Munising Bay, Huron Bay, and Keweenaw Bay at depths between 10 and 15 fathoms.

Catches of lake trout, most of which were under 9 inches in length, amounted to slightly over 7 pounds in those drags yielding trout. The largest number of trout taken per drag occurred in Keweenaw Bay at 30 fathoms. All but one trout captured were fin-clipped. Special efforts were made to return trout to the water in good condition throughout the investigation.

Noteworthy catches of other species included 200 and 255 pounds of commonsuckers at 14 to 10 fathoms, respectively, in Huron Bay. One 7-pound sturgeon was taken in Huron Bay at 14 fathoms. Young herring occurred in most of the drags completed near the Huron Islands, in Huron Bay, and in lower Keweenaw Bay.

Whitefish Bay Area: Echo soundings in the Whitefish Bay area indicated that most of the fish were concentrated in depths of 35 to 45 fathoms. Fishing results confirmed those observations. Nine drags made in depths from 7 to 30 fathoms produced a total of only 38 pounds of fish while 5 drags made in 35 to 45 fathoms yielded a total of 1,870 pounds. The bulk of the latter catches was chub of which one-third were of a large size suitable for smoking. The best individual catch of chub was 770 pounds taken in 35 fathoms north of Whitefish Point. A smelt catch of 200 pounds from 40 fathoms was taken in 1 drag. Smelt catches up to 18 pounds were taken in 4 other drags in depths from 35 to 45 fathoms. The few cisco that were taken were all large fish. Lake trout catches were light throughout the Bay and most of the 51 individuals captured were in the size range of 7 to 9 inches. Catches of other species were insignificant.

HYDROGRAPHIC DATA: Thermal gradients were recorded using a bathythermograph and continuous surface temperature recorder. Surface and bottom temperatures were nearly uniform and both ranged from 32° F. to 46° F.

Note: See Commercial Fisheries Review, Nov. 1964 p. 31



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 52 (October 21-November 7, 1964): To evaluate

new gear designed specifically for electrical shrimp fishing and compare the results with those previously obtained on the Mississippi grounds (Bowers cruise 51--Phase II, September 15-23, 1964) was the objective of this cruise in the Gulf of Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers.

The gear used on this cruise was identical to that used on the Mississippi grounds where daytime catches with the electrical gear averaged as high as 96 percent of the night catches in the standard gear. The methods used were also identical--the electric net (designated ES-6) was towed from one outrigger and a net of standard design was towed from the other. The average of the night catches in the standard net was considered 100 percent for purposes of comparison.

Bad weather and mechanical difficulties were encountered on this trip, but a total of 33 one-hour tows was made on the Tortugas shrimp grounds in depths of 12-13 fathoms and 17-18 fathoms.

Results showed the electric net yielded 25 to 50 percent of the night standard average during the daylight hours and 110 to 150 percent at night. Continued study of this gear in the Tortugas area was to be conducted by the George M. Bowers during late November.

Note: See Commercial Fisheries Review, January 1965 p. 31.



Gulf Fishery Investigations

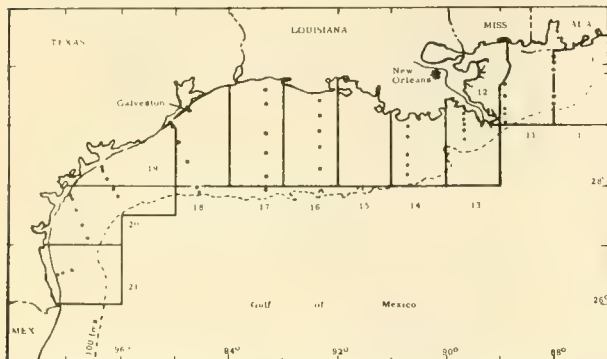
SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-23 (November 10-27, 1964): Very good catches of small white shrimp and better than moderate catches of brown shrimp were made during this cruise in the Gulf of Mexico by the chartered research vessel Gus III. The cruise was one of a series of cruises in a continuing shrimp distribution study conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

Eight statistical areas were covered on this cruise and although bad weather hampered operations in western areas of the Gulf, a total of 40 tows with a 45-foot flat trawl was made. In addition, 50 plankton tows, 48 bathythermograph, and 167 water (Nansen bottle) samples were taken. An experimental shell

dredge was used for the first time with excellent results during this cruise.

The largest total catch (194 pounds) of the cruise was from area 13 which yielded 146 pounds of medium size and small shrimp (21-25 and 41-50 count) from the 10-20 and up to 10-fathom depths, as well as 48 pounds of 31-40 count brown shrimp from the over 20-fathom depth. Large white shrimp (30 pounds of 15-20 count) were caught in the up to 10-fathom depth of area 16.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-23.

The best catch from area 14 consisted of 30 pounds of small white shrimp from the up to 10-fathom depth. Catches of brown shrimp in this area were very small--the best from over 20 fathoms which yielded 5 pounds of quite large shrimp (12-15 count).

The over 20-fathom depth in a number of other areas was fairly productive for brown shrimp, with 54 pounds of 21-25 count shrimp from area 21; 46 pounds of 15-20 count from area 20; 39 pounds of 31-40 count from area 16; and 16 pounds of 15-20 count from area 18.

A lion paw scallop, considered rare because not commonly taken, was caught at a 40-fathom station off the Trinity Shoal area.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, January 1965 p. 32.



Gulf of Mexico

FISHERY LANDINGS, 1963:

Fish and shellfish landings during 1963 in the Gulf States (West Coast of Florida, Alabama, Mississippi, Louisiana, and Texas) to-

taled nearly 1.4 billion pounds valued at a record \$98.8 million ex vessel. This was a decrease of 37.9 million pounds (3 percent), but an increase of \$4.3 million (5 percent) as compared with 1962.

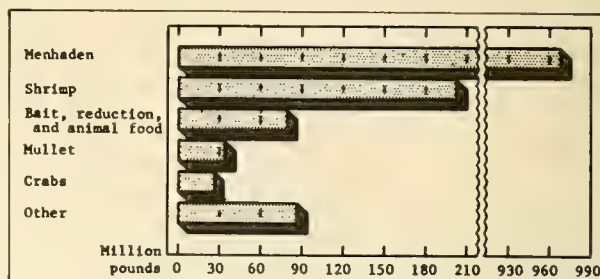


Fig. 1 - Gulf States catch, 1963.

Greatly reduced landings of menhaden (968 million pounds--down 89 million) and unclassified fish for use as bait, reduction, and animal food (80 million pounds--down 17 million) largely accounted for the lower volume. Partially offsetting this decline, however, was a sharp increase in the production of shrimp and oysters. Oyster landings of 24,139,000 pounds of meats showed a gain of 5,301,000 pounds over 1962, and were only 240,000 pounds short of the record 24,379,000 pounds taken in 1939. Shrimp landings totaled 203 million pounds--61 million pounds or 43 percent greater than the landings in 1962.

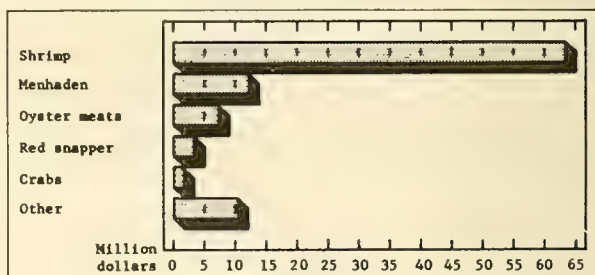


Fig. 2 - Value of Gulf States catch, 1963.

The increase in value resulted principally from production of shrimp--although the ex-vessel price was considerably below that in the previous year.

There were 24,483 fishermen engaged in the Gulf fishery in 1963--1,271 more than in 1962. Commercial fishing craft operating in those States during 1963 consisted of 3,369 vessels of 5 net tons and over, 9,992 motor boats, and 626 other boats.

Manufactured fishery products of the Gulf States in 1963 were valued at \$174 million--an increase of more than \$4 million as compared with 1962.



Industrial Fishery Products

FISH MEAL AND FISH SOLUBLES FIND STRONG DEMAND IN ANIMAL FEED INDUSTRY:

Mixed-feed manufacturers and experiment station scientists concerned with feed were visited in Connecticut, Delaware, New York, and Pennsylvania during late November 1964 by a member of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit, Boston, Mass.

The high esteem in which fish meal is held by producers of poultry and pig feeds was demonstrated by the concern shown by feed manufacturers over future supplies of the product. It may be assumed that the feed producers will not lower the fish meal levels in poultry and pig feeds until compelled to do so by shortages.

Also evident was the high regard that exists for high-quality United States fish meal as compared with imported meal. For example, one feed mill official said that whereas his starter and grower broiler rations both contain fish meal at a level of 5 percent, the former, the more critical ration, contains domestic meal whenever possible.

The experiment station scientists visited were enthusiastic over the use of fish products in mixed feeds. They also showed strong interest in future research on such products. Research scientists at one experiment station announced tentative plans for an investigation of the value of UGF (unidentified growth factor) in egg production. Those workers believe they have evidence that UGF increases egg production significantly when added to a laying ration that contains, with the exception of UGF, every ingredient known to be required by laying hens. If subsequent research confirms that finding, a large new market for fish solubles as a source of UGF may be opened up.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, November 1964: Preliminary data on U. S. production of fish meal,

Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
November 1964:			
East & Gulf Coasts	6,028	6,362	1,888
West Coast ^{2/}	1,996	452	1,022
Total	8,024	6,814	2,910
Jan.-Nov. 1964			
Total	201,052	164,715	80,576
Jan.-Nov. 1963			
Total	221,056	177,972	87,174

^{1/}Does not include crab meal, shrimp meal, and liver oils.

^{2/}Includes American Samoa and Puerto Rico.

oil, and solubles for November 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.



Maine Sardines

CANNED STOCKS, NOVEMBER 1, 1964:

Canners' stocks of Maine sardines on November 1, 1964, were down sharply from those of the same date in 1963 and 1962, but were 408,000 cases above stocks on hand 3 years ago on November 1, 1961 (the pack for the 1961 season was exceptionally small).

Carryover stocks at the canners' level amounted to about 622,000 cases on April 15, 1964, which is the traditional opening date of the Maine sardine packing season. Carryover stocks amounted to 660,000 cases on April 15, 1963, but only 33,000 cases on April 15, 1962, following the short-pack year.

During April 15-November 7, 1964, the Maine sardine pack totaled 840,000 standard cases, according to the Maine Sardine Council. That was much less than the 1,584,000 cases packed during the same period of 1963, but more than the 640,000 cases packed in the same period in 1961 when fishing was extremely poor.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, November 1, 1964 with Comparisons^{1/}

Type	Unit	1964/65 Season 11/1/64	1963/64 Season					1962/63 Season				
			7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62
Distributors	1,000 actual cases	291	234	254	291	261	308	217	215	264	271	230
Canners	1,000 std. cases ^{2/}	629	514	499	658	1,063	1,255	643	536	699	1,092	1,348

^{1/}Table represents marketing season from November 1-October 31.

^{2/}100 3 ³/₄-oz. cans equal one standard case.

Source: U.S. Bureau of the Census, Canned Food Report, November 1, 1964.

In November 1964, fishing for Maine sardines was spotty, but most Maine sardine plants were still operating with hopes of reaching a total pack of 900,000 cases by the end of the season, December 1, 1974.

Note: See Commercial Fisheries Review, Sept. 1964 p. 27.

* * * * *

INDUSTRY HOPES TO SELL TO THE PHILIPPINES:

The Republic of the Philippines is one of the world's largest purchasers of sardines and the Maine Sardine Council is seeking to get a substantial amount of this business. At stake is the annual Philippine requirement of canned sardines which is valued at about US\$20 million.

Presently the South Africa Republic is the major supplier of canned sardines to the Philippines, but it appears that the Philippine Republic would rather do its shopping elsewhere. However, price is an important factor and the South Africans are low cost producers.

Sardines are a major part of the diet of the 30 million Filipinos who are probably the world's largest consumers of this item on a per capita basis. NAMARCO, the Philippine Government buying agency, purchases virtually all the sardines consumed in the Philippines. (Maine Sardine Council, December 6, 1964.)



Navigation

OFFSHORE LIGHT TOWERS PART OF U. S. COAST GUARD MODERNIZATION PROGRAM:

To meet increasing demands of a rapidly changing world, the Coast Guard has embarked on a program to modernize its establishment ashore, afloat, and in the air. New vessels acquired by the Service during 1964 included the 210-foot medium-endurance cutters Reliance, Diligence, and Vigilant. It is expected that the goal of fleet modernization will be attained by the early 1970's.

Navigational Aids: Near Southport, N. C., the famous old Frying Pan Shoals Lightship was replaced by an offshore light tower. Eventually, permanent light towers will replace many of the Coast Guard lightships.

The new Frying Pan Light Tower is equipped with communications and oceanographic equipment. The new tower was designed by the Coast Guard to withstand the impact of ex-

traordinary wind and wave actions. Its life expectancy is 75 years. A crew of 6 Coast Guardsmen operate the tower, as compared to the 16 to 20-man crew required to operate a lightship.

The 550-ton deckhouse of the Frying Pan Light Tower is 25 feet high and 86 feet square. It is supported on 4 steel legs spread 60 feet apart. The legs are encased in 36-inch diameter steel pilings driven into the ocean floor. The deckhouse provides living quarters, and its roof can serve as a landing platform for the largest of Coast Guard rescue helicopters.



Fig. 1 - New U. S. Coast Guard Frying Pan Shoals Offshore Light Tower, placed in operation on November 24, 1964, replaces the famous old 133-foot lightship which guarded the shoals 28 miles southeast of Cape Fear, N. C., since she was built in 1930. Here, the lightship Frying Pan circles the tower, gives three farewell whistle blasts, and departs for Morehead City, N. C., to prepare for her new assignment at Cape May, N. J., as a relief lightship. The new tower is equipped with a radiobeacon and a 3.5-million candlepower light which from its elevation 175 feet above water is visible to mariners 17 miles seaward.

In 1964, the Coast Guard's more than 42,000 navigation aids helped to guide travelers both on and over the seas. The aids were of all types, including an atomic-powered lighthouse, as well as a series of 66 LORAN (Long Range Aid to Navigation) stations encompassing the globe. In May 1964, the world's first atom-powered lighthouse was placed in operation in Chesapeake Bay by the U. S. Coast Guard. It is anticipated that automatic facilities will

eventually supplant many of the manned light stations now in use.



Fig. 2 - An oceanographic student aboard the icebreaker Northwind prepares to lower a gravity meter to the bottom of the Chukchi Sea. Data collected will be used by scientists to measure the thickness and composition of the earth's crust beneath the Arctic basin. The Northwind was used in the U.S. Coast Guard's July to November 1964 Alaskan Patrol. Oceanographic investigations were made in the Beaufort, Chukchi, and East Siberian Seas. The Northwind also conducted measurements of the earth's gravitational field in the vicinity of Wrangell Island off the northeast coast of Siberia, and in the Aleutian Islands before returning to her homeport at Seattle, Wash.

Oceanography: In 1964, the Coast Guard broadened its participation in the national oceanographic effort by equipping half of its major cutters with modern oceanographic instruments. They will conduct long-term, comprehensive surveys of ocean phenomena. In April 1964, the Coast Guard established an Oceanographic Unit which will join with other Federal agencies in an intensive effort to unlock the secrets of the ocean.

Through oceanic studies carried out by its International Ice Patrol, Alaska Patrol, and ocean station vessels in the Atlantic and Pacific, the Coast Guard recorded new gains in its long established marine research program. It has been conducting marine studies since 1867 when the cutter Lincoln was dispatched to explore the waters off the recently purchased Alaskan Territory. (U. S. Coast Guard, January 4, 1965.)



New England Fisheries

GROUNDFISH AND SCALLOP LANDINGS IN 1964 AND FORECAST FOR 1965:

The abundance of groundfish on New England fishing banks is expected to hold steady during 1965, but the abundance of sea scallops will decline, according to the North Atlantic Regional Director of the U. S. Bureau of Commercial Fisheries. That forecast is based on information provided by biologists of the Bureau's Woods Hole Biological Laboratory who check the landings of commercial fishermen and sample fish and shellfish on offshore fishing banks with the research vessel Albatross IV.



Fig. 1 - Unloading haddock at Boston Fish Pier.

Haddock landings in New England in 1964 were approximately 115 million pounds, an increase from the 109 million pounds landed in 1963. The abundance of scrod haddock on New England banks is expected to increase in 1965. The increased abundance will be the result of the large year-class (spawned in 1963) that will enter the fishery as small scrod in the spring of 1965. Albatross IV surveys during the past 2 years indicate that the incoming year-class for 1965 is one of the largest ever found in surveys of the area. However, the following year-class spawned in (1964) appears to be a relatively small one.

Normally a haddock year-class as large as that spawned in 1963 would support the fishery for 2 years, but the situation for 1966 is made uncertain by the increased take of haddock by foreign vessels. What effect this increased foreign catch of haddock will have on United States landings in 1966 cannot be forecast at present.

New England landings of cod in 1964 were about 32 million pounds, compared with 36 million pounds in 1963. Abundance is expected to remain at prevailing levels during 1965.

Landings of ocean perch in New England in 1964 were down to 88 million pounds from the 108 million pound total in 1963. Abundance is expected to remain at present levels, and landings in 1965 will depend on intensity of fishing.

The yellowtail flounder fishery has been enjoying a series of good years due to increased abundance which is expected to remain high in 1965. Landings in 1964 were 77 million pounds compared with 78 million pounds in 1963; landings in 1965 are expected to be equally as good.



Fig. 2 - At Gloucester, Mass., basket of whiting is being swung from the vessel to the conveyor belt hopper on the wharf.

New England landings of whiting (silver hake) in 1964 were about the same as in 1963 (86 million pounds) in spite of intensive whiting fishing on Georges Bank by the U.S.S.R. The effect of the foreign fishing does not yet show on the index of abundance of the whiting stocks fished by the United States fleet. Consequently, there is no reason to believe at this time that whiting availability to the United States fleet will be any less in 1965.

Sea scallops have suffered a decline in abundance during the past 3 years, and Canadian fishing has increased. New England scallop landings declined from 18 million pounds in 1963 to 14 million pounds in 1964, while the 1964 Canadian catch was about the same as the 16 million pounds landed in 1963. Recent surveys by Albatross IV showed a con-

tinuing decrease in abundance so the total Canadian-United States scallop landings are expected to decrease in 1965. The share taken by the United States will depend upon the intensity of U. S. fishing.

Note: See Commercial Fisheries Review, Feb. 1964 p. 36.



North Atlantic

FOREIGN FISHING ACTIVITIES OFF COAST, NOVEMBER-DECEMBER 1964:

In order to observe foreign fishing activities in the North Atlantic, the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Although there appeared to be only limited Soviet fishing activity during the early part of December 1964, a total of 20 Soviet fishing vessels had been sighted by the end of the month. During the previous month, 26 vessels of similar types were seen. In December 1963 a total of 17 Soviet factory stern trawlers and one refrigerated fish transport was reported.

The Soviet fleet seen this past December was widely scattered over Georges and Browns Banks but gradually shifted its operations southward between Hudson and Black Canyons, 80 miles south of Black Island, R. I., on the western border of the International Commission for Northwest Atlantic Fisheries (ICNAF) convention area.



Shows type of Soviet vessels operating on Georges Bank during October 1964--factory stern trawler (Tropik class) alongside fish transport vessel.

The factory stern trawlers observed during December were fishing in 80 to 100 fathoms and were taking whiting and undetermined quantities of scup (porgy). Their dehydration plants were operating to such an extent that one U. S. fishing vessel some 20 miles away

sent a message to the Coast Guard that a ship was on fire.

This could possibly be an eventual fleet movement to the mid-Atlantic coast area as was the case during the previous winter.

During November 1964, there was a continued decline in Soviet fishing activity on Georges Bank and vicinity. A total of 26 Soviet fishing vessels (identified as 23 factory stern trawlers and 3 transport ships) was observed during November as compared with 47 in October. Their operations were more than double those observed in November 1963.

With the number of Soviet vessels in the Georges Bank area fluctuating from week to week, it was suspected that the Soviets as of the end of November, were alternating their operations between Georges Bank and eastern Nova Scotia areas. That fleet, according to size, was then generally spread out over the banks from the Cultivator Shoals to the Northern Edge of Georges Bank.

During November there was a noticeable drop in the Soviet vessels' catches of herring. This was noted by little or no fish left in the open storage areas on deck as evident when the Soviets were fishing intensively.

Note: See Commercial Fisheries Review, December 1964 p. 50.



North Atlantic Fisheries Explorations and Gear Development

TUNA AND SWORDFISH DISTRIBUTION STUDIES IN WESTERN NORTH ATLANTIC CONTINUED:

M/V "Delaware" Cruise 64-10 (October 15-November 5, 1964): Tuna and swordfish explorations in the western North Atlantic Ocean were continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during this three-week cruise east of New England and south of Nova Scotia. Objectives of the cruise were to: (1) continue a systematic survey of the distribution and abundance of tuna in the Northwest Atlantic; (2) investigate the availability of swordfish beyond areas of the present fishery; (3) evaluate application of synoptic oceanographic information received from the U. S. Naval Oceanographic Office by radio facsimile; and (4) evaluate a powered reel method for handling long-line gear.

Fishing Sets and Results: Sets of long-line gear were made during daylight hours at 8 stations with a total of 3,545 hooks fished. Gear arrangement consisted of a mainline buoyed from the surface at a 10-fathoms depth with eleven 20-fathom sections and 10 branch-lines between buoys.



Fig. 1 - Set-out of long-line gear from powered reel during Delaware cruise 64-10. Note A-K type snap (with branchline) being applied to 20-fathom mainline section.

Albacore tuna (*Thunnus alalunga*) were found at 5 stations with catch rates of 1 to 2 fish per 100 hooks, which approximates those noted on a previous Delaware cruise in this area (Cruise 63-11, November 13-December 10, 1963). Average weight of 27 fish caught

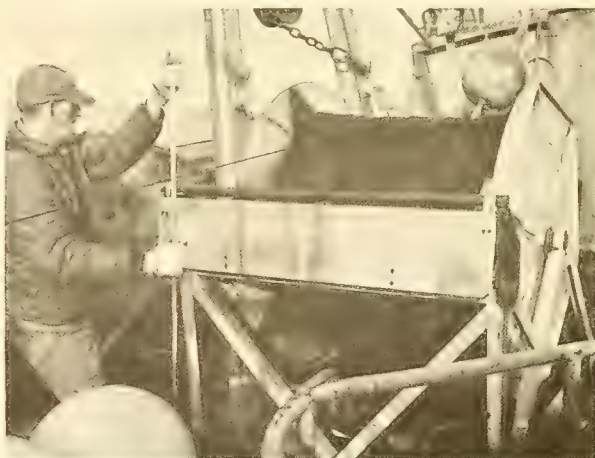


Fig. 2 - Powered long-line reel hauled long-line gear during Delaware cruise 64-10. Hydraulic motor and reducer are at lower left corner of frame. Manual level-winding was required after breakdown of mechanical level-wind device.

was 36.2 pounds; weight range was 26 to 62 pounds. Analysis of the catch position on the gear shows that the lower hooks (middle of mainline curve between buoys) took albacore

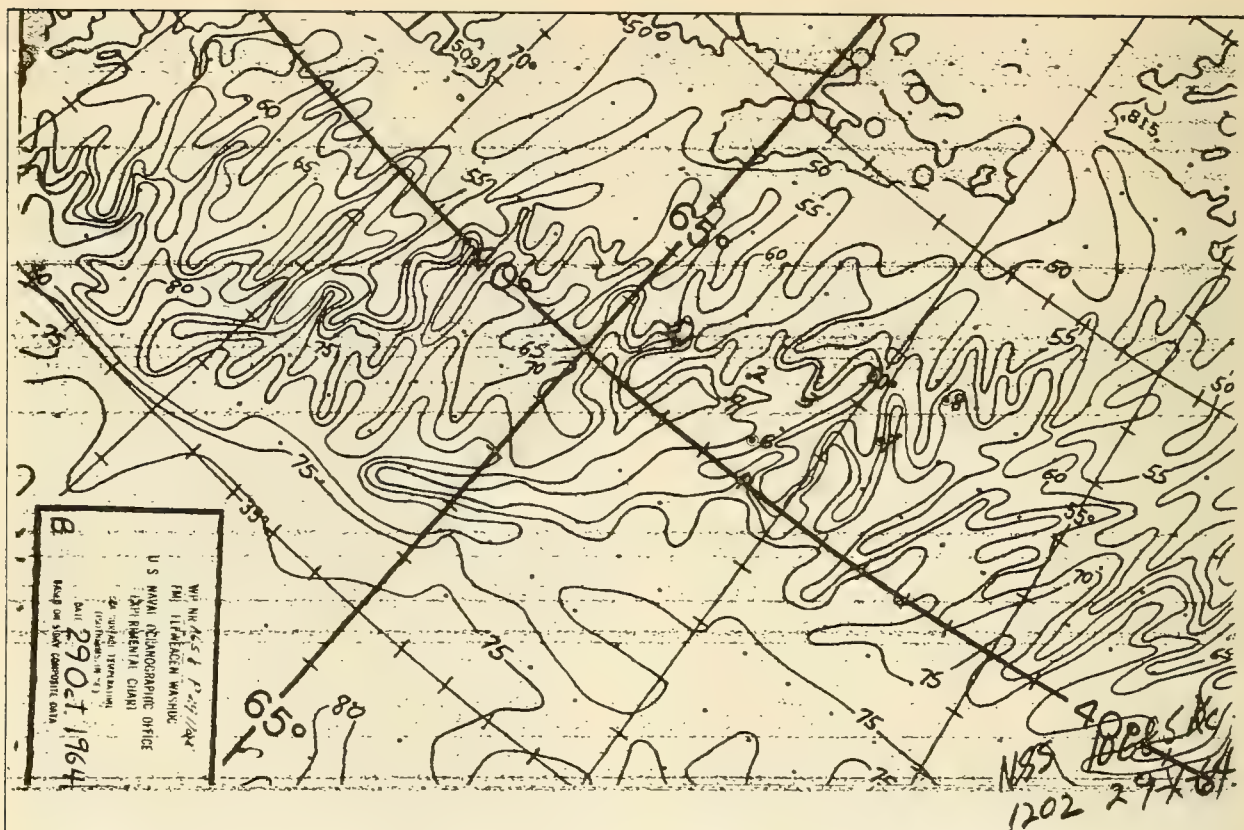


Fig. 3 - Radio-facsimile chart B (Cape Hatteras to the Grand Banks) received on the M/V Delaware during cruise 64-10. Sea surface temperature isotherms are based on 5-day composite data. Long-line fishing stations are numbered 1-8; station 6, 7 and 8 were fished on the basis of this chart. The actual chart measures 19 by 12 inches.

at twice the rate of the upper hooks (ends of main-line curve nearest buoys). Stomach content analysis of 20 albacore and 2 of 11 yellowfin tuna (Thunnus albacares) taken during the cruise indicated that the albacore were feeding well below the surface, while the yellowfin had been feeding at the surface. Average weight of the 2 yellowfin examined was 104 pounds. A total of 20 big-eyed tuna (Thunnus obesus) was caught at 6 stations; 6 of those were examined and averaged 95 pounds.

Due to severe weather and sea conditions during the second half of the cruise, no night long-line sets could be made and no swordfish data were obtained.

In cooperation with participating agencies, a total of 30 tuna, 2 white marlin, and 7 shark were tagged and released with dart tags. Tuna blood samples were collected for serological analysis by the Subpopulations Program at the Bureau's Biological Laboratory in Honolulu. Other data collected and examined included lengths, weights, stomach contents,

and sexual condition of all fish taken aboard the vessel. Other long-line catches of particular scientific note were 8 pelagic stingrays (Dasyatis violacea), and one deep-sea pomfret (Taractes princeps). A 105-pound white marlin (Tetrapturus albidus) taken 260 miles south-southwest of Halifax, Nova Scotia, contained a Z-nickel sportfisherman's hook embedded in its stomach wall, suggesting a movement of this fish to the east from in-shore sportfishing areas west of Cape Cod.

Additional Thermal Data Utilized: During long-line cruises made by the vessel Delaware over the last two years, exact station positions have been determined on the basis of environmental data gathered and evaluated at sea. Bathythermograph (BT) transects and sea-surface thermograph recordings provided much of the information, but have not given synoptic coverage needed to determine most likely fishing areas (current boundaries, thermal gradients, upwellings, eddies, etc.).

Sea-surface temperature isotherm charts with 5° F. increments for the western North Atlantic, from Florida to Newfoundland, have been available for several years from the U.S. Naval Oceanographic Office's radio facsimile broadcasting system at Washington, D. C. Two overlapping 5-day composite charts are transmitted daily; charts are revised twice each week to provide a continuous synopsis of the sea-surface thermal environment.

Radio-facsimile recording equipment installed on the Delaware for this cruise received these charts which were used in determining areas for long-line sets the following day. Continuous thermograph records and bathythermograph casts were made to check the validity of the charts, and to aid in slight navigational adjustments in locating precise thermal conditions for setting. With few exceptions the information from those charts proved accurate to within 10 miles of the positions selected the previous day. Further application and analysis of the charts for locating likely fishing areas is anticipated in future pelagic explorations.

Additional charts received with this equipment included analyses and prognostics for weather, sea, and wave conditions. With experience in interpretation it is expected that this information will directly aid in safer and more economical operation of the vessel in the open ocean area.

Modified Long-Line Gear Trials: Since 1957, long-line explorations of the vessel Delaware have used galvanized tubs ("baskets") and a Japanese long-line hauler to handle gear. For this cruise a hydraulically-powered reel was designed, constructed, and installed to: (1) increase the speed of setting and hauling the gear; (2) increase the safety of long-line operations; and (3) at the same time reduce the number of men required to operate the fishing equipment.

The reel was made of steel, 60 inches in diameter, with a 24-inch diameter core 50 inches in length. The reel frame had a base dimension of 68 x 61½ inches, and a height of 36 inches. Hydraulic power was provided by a 30 horsepower, 45 gallon-per-minute pump system with 1-inch hoses. An automatic level-wind was fitted on the frame and driven by a chain assembly from the reel's shaft. Capacity of the designed reel was 20 miles of ¼-inch line with looped and knotted sections of 20 fathoms. Speed and power control con-

sisted of a by-pass lever positioned at the starboard rail fairlead. Three fairleads guided the line during hauling from the rail to the level-wind. In setting the gear (port-side--leeward), one fairlead was positioned on the ship's rail, and the line was backed off under power to obtain correct slack in the mainline. Two tables were set at the port rail to hold tubs of baited branchlines (30 branchlines per tub). The branchlines and buoylines were fitted with halibut-type A-K tuna snaps which were applied to the 20-fathom mainline sections between the knots. Two pairs of men alternated in setting branchlines, one man of each pair placing the snap while the other threw the branchline. Gear was hauled on the starboard side (windward); branchlines were cleared from the mainline and recoiled in the tubs ready for the next set.

Several immediate modifications to the system were indicated during the cruise: (1) the reel and frame should be redesigned for greater strength, the core with a larger diameter and greater length; (2) the level-wind needs redesigning; (3) an auxiliary control should be placed at the reel; (4) an improved branchline tub is required to prevent snarls during set out; (5) a chute parallel to the rail to receive baited hooks would increase safety and reduce the number of men setting branchlines from 4 to 2; and (6) a mainline guide chute after the setting area at the rail would control the angle of mainline on setout to facilitate placing the branchline snaps.

Preliminary results from first trials of the new gear-handling system were encouraging. Both setting and hauling times have been appreciably shortened and further increases in speed are anticipated after modifications. Hooks are now separate from the mainline when the gear is aboard ship, and setting is readily accomplished from the protected (leeward) side of the vessel--both major safety factors. Although the number (6) of men needed on deck was not changed for those early trials, with changes in the system, the number should be decreased by two men.

Note: See Commercial Fisheries Review, September 1964 p. 28.



North Atlantic Fisheries Investigations

SEA HERRING

POPULATION SURVEY CONTINUED:

M/V "Delaware" Cruise 64-9 (October 1-8, 1964): The purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware was to: (1) sample populations of adult sea herring and to obtain related environmental data; (2) obtain sea herring blood samples; (3) make plankton tows for fall-spawned herring larvae; and (4) obtain blood samples and measurements from off-shore lobsters. The areas of operations were Georges Bank, Cashes Ledge, Fipennies Ledge, Jeffreys Ledge, and Platts Bank.

A total of 7 otter-trawl sets and 1 gill-net set were made at stations worked. The trawl sets (45 minutes duration) made in waters from 40 to 55 fathoms yielded herring catches ranging from one-quarter to 110 bushels. The gill-net set yielded only 5 herring. Herring obtained during the cruise were from 19.3 to 35.1 centimeters (7.6 to 13.8 inches) long. Preliminary examination indicated that the 1960 year-class was dominant in all catches. Shipboard examination of gonadal development of adult herring indicated that the majority of fish had spawned. During the cruise 215 herring were sampled for blood which was frozen in liquid nitrogen. No lobsters were obtained.

A total of 33 one-meter net plankton tows lasting 15 minutes each (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface) were made during the cruise. A total of 362 herring larvae with a mean length of 11 millimeters or 0.4 inches (range 6-20 millimeters) were obtained. About 98 percent of the larvae were from stations on Georges Bank.

Drift bottles (5) and sea-bed drifters (5) were released at each of the plankton tow stations. In addition, at each station bathythermograph (BT) casts were made, surface salinity samples collected, and weather observations recorded. The salinity ranged from 32.7 to 33.1 and surface temperatures ranged from 52.0° F. to 60.0° F. Thermoclines were present at all deep-water stations (40 fathoms or more) and absent in all waters of 25 fathoms or less. The greatest temperature range occurred at one station where a difference of 6° was recorded between 50 and 75 feet.

M/V "Delaware" Cruise 64-11 (November 17-22, 1964): The objectives of this cruise by

the exploratory fishing vessel Delaware were about the same as those of cruise 64-9 conducted in October. The areas of operation were Veatch's Canyon, Hydrographer Canyon, and Georges Bank.

Two lobster trawl sets were made during this cruise. The sets made in waters of 172 and 180 fathoms yielded 31 lobsters of which 25 were females and 6 males. Four of the females were berried. Lobsters that were hard-shelled totaled 22 (the 6 males were all hard-shelled). The mean weight of the catch was about 2½ pounds and the range in weight was ⅙ to 13 pounds each. In addition to those observations, rostrum to cervical groove, orbit to cervical groove, carapace length, and abdomen length measurements were recorded. A total of 28 lobster blood samples were obtained. On this cruise 2 herring trawl sets were made. The sets (45 minutes duration) made in waters of 50 fathoms yielded a total of 17 bushels of herring which were from 21.5 to 32.1 centimeters (8.3 to 12.6 inches) long. The 1960 year-class was dominant in the two catches, followed in percentage of occurrence by the 1961 year-class. Shipboard examination of gonadal development indicated that the majority of the sampled adult herring had spawned (a few running herring were observed), and that the 1961 year-class fish were in stage II and would not spawn until the fall of 1965. One hundred herring blood samples were obtained and frozen in liquid nitrogen.

Plankton operations on lobster consisted of 2 one-meter net plankton tows of 15 minutes duration (at the surface) but no lobster larvae were obtained. Those on herring consisted of 5 one-meter net plankton tows of 15 minutes duration (5 minutes at 10 meters, 5 minutes at 5 meters, and 5 minutes at the surface), 2 at approximately the same sites as where the lobster larvae plankton tows were made, and 3 on Georges Bank. A total of 90 herring larvae with a mean length of 14 millimeters or 0.6 inches (range 7 to 28 mm.) were obtained.

Sea-bed drifters (5) were released at each of the plankton tow stations. Bathythermograph (BT) casts were made at each station, surface salinity samples collected, and weather observations recorded. The salinity ranged from 33.5 to 33.6.

Note: See Commercial Fisheries Review, January 1965 p. 39.

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LARVAL HERRING DISTRIBUTION IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 8-64 (November 3-12, 1964): To determine the distribution of larval herring along the coast of the Gulf of Maine was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Rorqual. The area of operations was the coastal area between Cape Ann and Machias Bay within the 50-fathom line.

A total of 21 stations were occupied during the cruise. Oblique tows were made at each station at 6 knots using a Gulf III trawl with a Boothbay Depressor No. 3 and one with a Boothbay Depressor No. 1. The gear usually were towed individually for one mile each at three depths (surface, 10 and 20 meters), or about 33 to 66 feet. When the bottom terrain permitted, tows were made on bottom, halfway to the surface, and at the surface. Special tows were made with a Gulf III and meter net at the surface to obtain lobster larvae.

Nansen-bottle casts were made at each station to depths of 0, 10, 20, 30 meters (from 33 to 98 feet), and immediately above the bottom. Each cast was accompanied by a bathythermograph (BT) lowering, a photometer reading, and a Secchi disc reading. Sea-bed drifters (5) and surface drift bottles (5) were released at each station.

The Boothbay Depressors Nos. 1 and 3, attached to a trawl and Gulf III respectively, were equipped with depth-sounding gear and a record of their stability obtained at various depths and on the bottom.

The number of herring larvae caught by the Gulf III net was similar to that of other years during the fall spawning season. A large number of herring larvae were caught in the trawl which had not been used previously during fall cruises. The largest trawl catch was 2,293 herring larvae with the largest catches in the western portion of the area surveyed. Few larvae of other fish species were taken and no lobster larvae were obtained. No concentrations of fish were detected with the fathometer.

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CONTINENTAL SHELF WATERS SURVEYED:

M/V "Albatross IV" Cruise 64-14 (December 13-18, 1964): To conduct an environmental survey of Continental Shelf in North Atlan-

tic waters in the area bounded by longitudes 64° W. and 72° W. was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

During the cruise, 75 hydrographic stations were occupied throughout the area. Water samples were obtained at depths of 1, 10, 20, 30, 40, 50, 75, 100, 150, 200, and 250 meters for the determination of temperature, salinity, dissolved oxygen, and chlorophyll. In addition, 24 hydrographic stations were occupied at a fixed position 60 miles south of Martha's Vineyard to determine the temporal fluctuations of those properties, and of zooplankton biomass. Fourteen fish survey stations were made on Georges Bank to complete the fall survey series.

Note: See Commercial Fisheries Review, Nov. 1964 p. 46.



North Pacific Fisheries Explorations and Gear Development

EXPERIMENTAL FISHING WITH PELAGIC TRAWL:

M/V "St. Michael" Cruise 5 (October 26-November 20, 1964): The objectives of this cruise off the coast of Washington by the exploratory fishing vessel St. Michael, chartered by the U. S. Bureau of Commercial Fisheries, were to: (1) conduct fishing trials with the "Cobb" Pelagic trawl rigged to fish off bottom while the otter boards retained bottom contact; (2) make underwater observations of fish behavior within the influence of various trawls; (3) determine the speed of water passing through different parts of a trawl; and (4) conduct fishing trials using two vessels to pull the "Cobb" pelagic trawl and the Bureau designed lampara trawl.

Near-bottom fishing with the Cobb pelagic trawl was undertaken off the coast of Washington in areas of known Pacific hake concentrations. Fishing was restricted by poor weather and a Pacific hake distribution change. The largest single catch was 17,500 pounds taken during a 30-minute tow. Subsequent underwater observations of the trawl indicated the configuration to be less than desirable with the near-bottom hook-up.

Scuba dives were made on the lampara trawl during fishing tests. Pacific herring (Clupea pallasii), surf smelt (Hypomesus

pretiosus), and three-spine stickleback (*Gasterosteus aculeatus*) were observed within the trawl. Large numbers of fish entered into the body of the trawl but resisted moving into the codend. Pacific herring and surf smelt maintained a swimming speed of about 2 knots for periods greater than 25 minutes and swam out of the trawl through the mouth and meshes during net retrieval.

Current measurements at various positions inside and out of the trawl were made while the trawl was being towed. Recordings of water current were made to determine actual swimming speed of fish within the trawl.

Several drags were made on this cruise by pulling various trawls by two vessels. Limited time permitted only enough drags to develop a suitable system of operation. One catch containing 8,000 pounds of herring and smelt was made.

Note: See *Commercial Fisheries Review*, January 1965 p. 39.

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HAKE POPULATION SURVEY AND PELAGIC TRAWL TESTS CONTINUED:

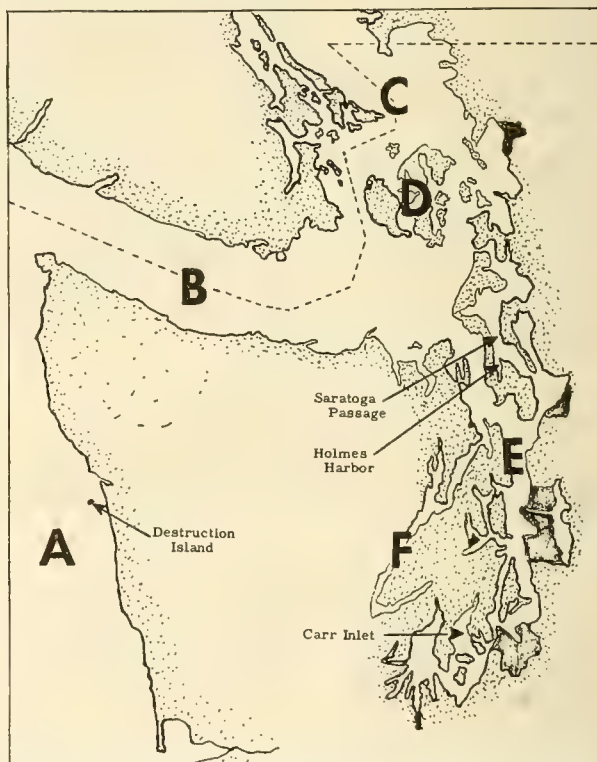
M/V "John N. Cobb" Cruise 68 (October 19-November 20, 1964): This 5-week exploratory midwater trawling cruise was conducted in Puget Sound and along the Washington State coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb.

The primary objectives of the cruise were to: (1) investigate the distribution and abundance of hake; (2) evaluate the incidental catches of other pelagic fish taken with the midwater trawl; and (3) cooperate in evaluating the fishing effectiveness of a midwater net used in two-vessel trawling.

Echo-sounding transects were made to locate concentrations of hake, and their availability was measured with the "Cobb" pelagic (midwater) trawl. No concentrations of hake were found in the Strait of Juan de Fuca, Strait of Georgia, or the San Juan Islands area. Small catches of less than 180 pounds of dogfish (*Squalus acanthias*) and yellowtail rockfish (*Sebastes flavidus*) per half hour of trawling were taken in the Strait of Juan de Fuca. Only dogfish were encountered in the Strait of Georgia where catches of less than 50 pounds per half hour of trawling were taken.

Relatively large concentrations of fish were found in Carr Inlet in southern Puget Sound,

Holmes Harbor, and Saratoga Passage in northern Puget Sound, and Hood Canal. Three drags made in Carr Inlet primarily yielded dogfish with the largest catch of 20,000 pounds taken in a 30-minute drag consisting of 14,000 pounds of dogfish, 5,000 pounds of pollock (*Theragra chalcogrammus*), 800 pounds of hake, and 200 pounds of miscellaneous species. Approximately 90 percent of the catches taken in Holmes Harbor, Saratoga Passage, and Hood Canal were hake, with the individual hake catches ranging from 550 to 8,000 pounds per 30-minute drag. All the hake from northern Puget Sound were small, averaging about 35 centimeters (approximately 14 inches) in length compared to an average length of about 56 centimeters (22 inches) for hake caught off the Washington Coast.



Shows areas of operation during John N. Cobb cruise 68. Echo-sounding transects were made off the west coast of Washington State (A), in the Strait of Juan de Fuca (B), Strait of Georgia (C), San Juan Islands area (D), Puget Sound (E), and Hood Canal (F).

Although still present, hake appeared to be less concentrated off the Washington coast than during previous surveys in August and September 1964. Two 1-hour midwater trawl sets yielded catches of 674 and 970 pounds of hake. Yellowtail rockfish and dogfish were the only other species taken off the Washington coast.

During the last week of the cruise, the John N. Cobb participated in gear trials with the chartered vessel St. Michael in Bellingham Bay. During the trials, the two vessels towed a single net over known herring grounds. Four sets were made with the "Cobb" pelagic trawl and two sets were made with the newly developed pelagic trawl (having long wings in a configuration similar to a lampara seine). The highest catch rate obtained was 8,000 pounds of herring and smelt taken in a 1-hour drag.

For limited periods during the cruise, observers came aboard the John N. Cobb from the Washington State Department of Fisheries, Oregon State University, the University of Washington, and Washington Peninsula College.

Note: See Commercial Fisheries Review, Jan. 1965 p. 39; Dec. 1964 p. 52.



Oceanography

UNDERWATER CAMERA SYSTEM DEVELOPED FOR WORK AT GREAT DEPTHS:

An underwater camera for use at the ultimate ocean depth (37,000 feet) has been developed by a firm in Boston, Mass. Equipped with a strobe lighting system, the camera can be lowered from an oceanographic vessel by means of a cable until the camera is a few feet above the surface or object to be photographed. As the research vessel moves along, the camera can take pictures at the rate of 12 per second. The camera carries a 100-foot roll of 35 mm. film which enables it to take up to 500 pictures in one run.

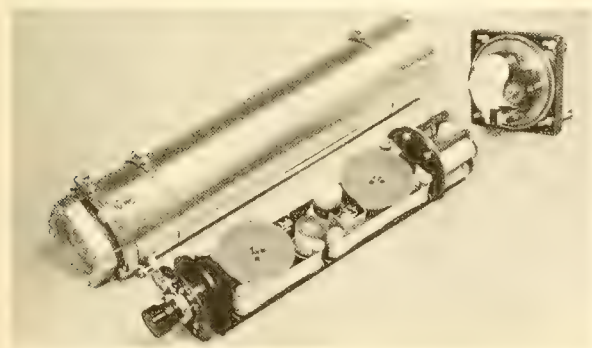


Fig. 1 - Underwater camera and pressureproof housing. The depth capability of the camera is 12,000 meters (39,000 feet).

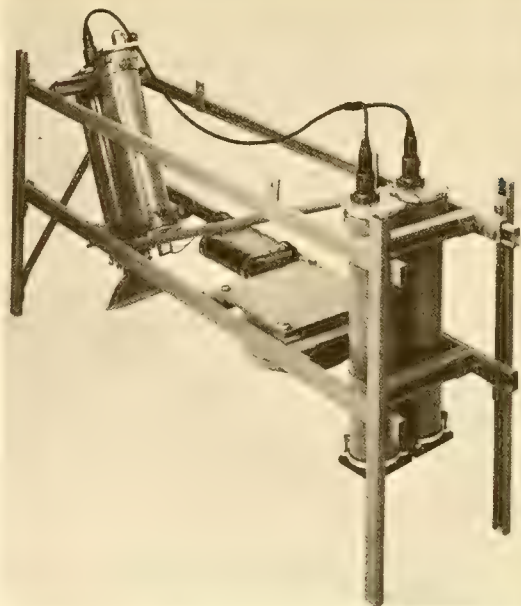


Fig. 2 - "Stereo" system for underwater photography. Mounted on the 6-foot steel frame are 2 cameras, light source, pinger system (for positioning cameras), and current compass. This system carries film to produce up to 500 pairs of bottom photographs covering 17 square meters or more per exposure.

A steel mount for the underwater camera, lighting system, and related components is available. The complex of photographic equipment is available in several designs including a lightweight fisheries system, a 2,300-exposure survey system, and 20-exposure Photo-Grab system. The underwater photographic systems have been used in deep-sea rescue, research, and mapping work.



Salmon

U. S. PACIFIC COAST CANNED STOCKS, DECEMBER 1, 1964:

Canners' stocks in the United States of Pacific canned salmon totaling 3,751,410 actual cases on December 1, 1964, were 280,990 cases less than stocks on hand November 1, 1964. Pink salmon made up 52.7 percent (2.0 million cases, mostly 1-lb. talls) of the total canners' stocks on December 1, 1964, followed by chums (783,000 cases, mostly 1-lb. talls), and reds (675,000 cases). The remainder of about 8.4 percent consisted of coho and king salmon. About 80 percent of

the pink salmon stocks on hand was 48 1-lb. cans, and the balance mostly 48 $\frac{1}{2}$ -lb. cans.

Table 1 - Total Cannery Stocks of Pacific Canned Salmon, December 1, 1964			
Species	Dec. 1, 1964	Nov. 1, 1964	Oct. 1, 1964
	(No. of Actual Cases)		
King	94,648	104,399	134,337
Red	674,711	750,483	856,770
Coho	222,095	250,162	230,519
Pink	1,977,112	2,109,841	2,218,068
Chum	782,844	817,515	863,474
U.S. Total	3,751,410	4,032,400	4,303,168

Table 2 - Total Cannery Stocks on Hand December 1, 1964 (Sold and Unsold), By Species and Can Size						
Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb.	11,379	108,105	75,492	8,714	1,222	204,912
48 $\frac{1}{2}$ -lb.	74,034	338,582	42,987	346,666	113,076	915,345
48 1-lb.	8,970	226,866	91,494	1,573,104	646,541	2,546,975
12 4-lb.	265	1,158	12,122	48,628	22,005	84,178
Total	94,648	674,711	222,095	1,977,112	782,844	3,751,410

Table 3 - Cannery Shipments from July 1, 1964, to December 1, 1964, By Species and Can Size						
Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb.	12,868	319,827	47,200	2,967	222	383,084
48 $\frac{1}{2}$ -lb.	62,808	348,512	11,388	256,802	45,015	724,525
48 1-lb.	13,151	271,188	77,015	824,820	232,066	1,418,240
12 4-lb.	151	3,792	9,368	50,769	17,537	81,617
Total	88,978	943,319	144,971	1,135,358	294,840	2,607,466

From November 1 to December 1, 1964, pink salmon stocks were lower by 132,729 cases, reds were down 75,772 cases, and chums were down 34,671 cases.

Carryover stocks at the cannery level amounted to 1,175,588 standard cases on July 1, 1964, which is the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply this season to 5,097,944 standard cases.

Shipments at the cannery level July 1, 1964, to December 1, 1964, totaled 2,607,466 actual cases (equal to 1,957,890 standard cases).

Information on canned salmon stocks is based on reports from canneries who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, December 24, 1964.)

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SEATTLE, WASH., TO HAVE NEW \$2 MILLION CANNED SALMON WAREHOUSE:

A \$2-million automated warehouse for canned salmon storage is scheduled to be built on a 10-acre site in the Port of Seattle's Lower Duwamish Industrial District, with completion set for May 1966. The storage complex will include a 300,000-square-foot warehouse just across 26th Avenue SW. from Pier 5 and a 1,000-foot tunnel and underground conveyor system to transport salmon between the pier

and warehouse. (Port of Seattle Reporter, December 1, 1964.)

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INTERIOR DEPARTMENT CLASSIFIES ATLANTIC SALMON AS "ENDANGERED" SPECIES:

Atlantic salmon has been included in a U. S. Department of the Interior list of "endangered" fish, birds, and mammals. A species is endangered when its survival is seriously threatened.

New Englanders once sought the Atlantic salmon as an important sport and commercial fish. But in the past 75 years both the sport and the commercial catch have dropped sharply. Today the Atlantic salmon is found in limited numbers in only 8 Maine streams. Smaller than the Pacific salmon, the adult Atlantic species reaches 10 to 15 pounds. It is succumbing to pollution, obstructions caused by dams, and changes in waterflows.

The list of endangered species was sent for comment to all state game and fish departments and other interested organizations. The cooperation of those groups is being sought for a stepped-up program to preserve endangered wildlife. The U. S. Department of the Interior is considering seeking legislation that would enable it to carry out a 10-year program of land acquisition to preserve the essential habitat of rare and endangered species.



Shellfish

HEALTH PROTECTION OF U. S. SHELLFISH CONSUMERS EMPHASIZED AT NATIONAL SHELLFISH SANITATION MEETING:

There was agreement by participants attending the fifth National Shellfish Sanitation Workshop on major improvements in the health protection of United States consumers of shellfish products, the U. S. Public Health Service announced November 20, 1964.



Conferees of the 5th National Shellfish Sanitation Workshop held in Washington, D. C., November 17-19, 1964, listening to Wesley E. Gilbertson, Chief of the Public Health Service Division of Environmental Engineering and Food Protection.

The three-day meeting, held November 17-19, 1964, at Washington, D. C., was attended by nearly 200 of the Nation's shellfish experts. Participants included shellfish sanitation control officials from 22 shellfish-producing states, representatives from the United States shellfish industry, Federal Government, and from Canada and Japan. Agreement was on the following major points:

1. The Cooperative State-U.S. Public Health Service-Industry Program for the Certification of Interstate Shellfish Shippers is functioning effectively in terms of consumer protection but should continue to strengthen its effectiveness through technical and administrative improvements.
2. Protection of shellfish growing areas from contamination must be a consideration of state and Federal agencies planning or conducting water pollution control and abatement programs.
3. The practice of re-laying shellfish from beds in contaminated growing areas should be carried out on a wider scale wherever practicable to reduce shellfish populations in contaminated areas.

4. Control over shellfish harvesting and transportation of the product to certified dealers should be tightened wherever possible. (In many areas that can be accomplished through inspection of designated "landing areas.")

5. Existing schedules of fines and penalties for harvesting shellfish in polluted areas should be reviewed by the producing states and the U.S. Public Health Service, with a view to better informing the courts on the health consequences of illegal sale of polluted shellfish and enabling the states to seek fines and penalties commensurate with the potential hazard to public health.

6. The states recognize the need for strong marine police supervision of polluted areas, harvesting practices and re-laying, and that adequate funds be made available for those activities.

The Workshop also acted on scores of technical amendments to the U. S. Public Health Service "Manual of Recommended Practice for the Sanitary Control of the Shellfish Industry," all of which are aimed at strengthening the national program. These included controls over sport harvesting, a uniform national sanitation standard for all shellfish, adoption of depuration or the process of in-plant self-purification of shellfish from polluted or marginal waters, establishing shellfish preserves, adopting the practice of aquaculture.

Participants also were addressed by a manufacturer with a proposal for radar surveillance of shellfish growing areas to detect poachers. Other speakers discussed the use of chemicals on or near shellfish growing areas, relationship of shellfish sanitation to pollution abatement, advances in shellfish culture, work of the U. S. Public Health Service shellfish sanitation research centers, shellfish imports, heat-shock method of preparing oysters for shucking, and bacteriological standards for growing areas. (Press release, U. S. Public Health Service, Washington, D. C., November 20, 1964.)



Shrimp

UNITED STATES CONSUMPTION AT RECORD HIGH LEVEL:

The American people are eating more shrimp than ever before and the total consumed is climbing each year, reported the U. S. Department of the Interior, December 3, 1964. On a per capita basis, United States consumers are eating 75 percent more shrimp than in the years immediately following World War II.



Fig. 1 - Peeling shrimp by hand in a Florida breaded shrimp plant.

In the first 6 months of 1964, sales of fresh and frozen shrimp were up 22 percent over the same period a year earlier. Through August 1964, sales were still 18 percent above the first 8 months of 1963. There appears to be no single answer to why Americans are eating more shrimp on a per capita basis. But rising consumer purchasing power, growing consumer preference, development of new shrimp products, wider distribution, quality improvement, and more sales promotion have all been contributing factors.

Sales of frozen breaded shrimp products have increased rapidly since 1950, with new records being set each year. Sharp gains also have been made in sales of frozen peeled and deveined shrimp. Sales of fresh or frozen headless shrimp also have been increasing and shrimp sold in that form still holds the largest share of the market. Economists say that consumption of higher-priced foods such as shrimp is gaining as disposable personal income increases, a significant trend that promises well for the shrimp industry and with expectations of greater consumption as the trend continues.



Fig. 2 - Breaded shrimp moving on conveyor belt to weighing and packing line--Florida breaded shrimp plant.

The domestic shrimp industry is principally in the Gulf States. The United States also imports large quantities of shrimp (167 million pounds in 1963). Mexico has been the principal source with India and Latin American countries supplying increasing quantities in recent years.



Fig. 3 - Weighing and packing breaded shrimp in a Florida plant.

Shrimp prices generally, during the first 8 months of 1964, have been below the same months of 1963, but in August 1964 prices were just about equal to the five-year 1959-63 average for that month.

Shrimp supplies held in cold-storage warehouses on September 1, 1964, were above the 1959-63 average, but those supplies were not large in relation to current consumption. Domestic shrimp landings are generally lower for 1964, but imports for the first 8 months were slightly higher. Record cold-storage warehouse stocks at the beginning of 1964 contributed to the large supply available for consumption in the early months of this year.

The U. S. Bureau of Commercial Fisheries conducts extensive research into increasing shrimp populations, finding new shrimp fishing areas, and developing new and better gear with

which to catch shrimp. Donald L. McKernan, the Bureau Director, said that historically the United States shrimp fishery has been a night-time operation. This is because shrimp burrow into the bottom sediment during daylight hours to avoid predators and consequently are not available for capture by trawl nets. He said research by the Bureau has resulted in the application of low-voltage electricity to the trawls. This technique stimulates shrimp from their burrows up into the water where they are caught by the trawl. The method permits day and night fishing which results in more efficient utilization of vessel and personnel. The low energy levels used have no harmful effect on shrimp or related organisms.

Scientists of the U. S. Bureau of Commercial Fisheries are also continuing research into the distribution, growth, survival, and abundance of shrimp. One goal is the development of culture methods for rearing shrimp from the egg to postlarval stages under seminatural conditions. In recent years, the Bureau has encouraged operators of larger and more powerful vessels to fish farther offshore where new shrimp resources have been discovered by the Bureau's exploratory fishing vessels. At the same time, improved packing and freezing techniques have extended the market area for shrimp, further aiding stability and economic growth in the industry.



South Atlantic States

FISHERY LANDINGS, 1963:

In 1963 landings of fish and shellfish at ports of the South Atlantic States (North Carolina, South Carolina, Georgia, and the East Coast of Florida), including landings from fresh-water areas of Florida, amounted to 371 million pounds, valued at \$19.5 million ex-vessel. Compared with the previous year, this was an increase of over 65 million pounds, but a decrease of nearly \$4 million. Record landings of blue crabs and larger catches of menhaden in North Carolina waters were the major factors in the increased landings. The decline in value was due to an almost complete "crop failure" of shrimp in nearly all South Atlantic waters. In addition to poor catches, the ex-vessel prices for shrimp were relatively low during the peak production periods.

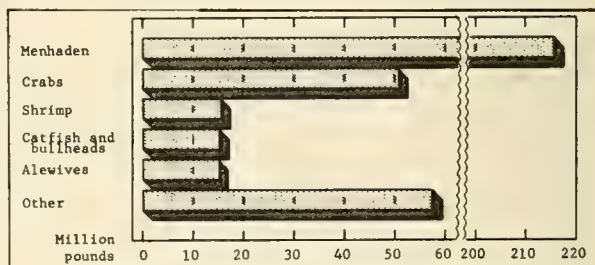


Fig. 1 - South Atlantic States catch, 1963.

There were 11,940 commercial fishermen in the South Atlantic area--569 less than in 1962. Most of the decrease was among fishermen in the shore and boat category. Ves-

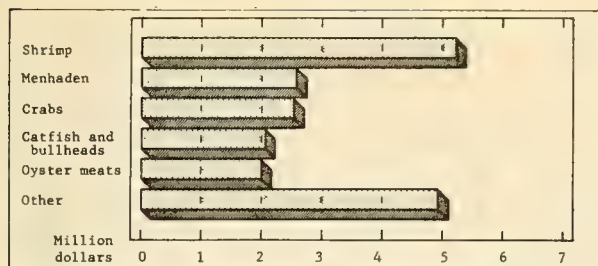


Fig. 2 - Value of South Atlantic States catch, 1963.

sels of 5 net tons and over numbered 1,157--an increase of 16 over the previous year.

Manufactured fishery products of the South Atlantic States in 1963 were valued at \$40.1 million--a decline of \$5.3 million compared with 1962.



Specifications

FEDERAL SPECIFICATIONS FOR CHILLED AND FROZEN FISH:

In Headquarters Notice to the Trade No. 155 (64) of November 13, 1964, the Defense Subsistence Supply Center (DSSC) distributed:

(1) Deviation List (of May 15, 1964) for Federal Specification PP-F-00381f, Fish--Chilled and Frozen

(2) DSSC Articles 345 concerning inspection of Fish--Chilled and Frozen

Those instructions will be cited in contracts for Fish--Chilled and Frozen--effective with awards made on and after January 4, 1965.

The Deviation List incorporates changes based upon currently available technical information. Those changes are being processed for inclusion in an amendment or revision of the Federal Specification on Fish--Chilled and Frozen.



United States Fisheries

COMMERCIAL FISHERY LANDINGS, 1964:

Total catch: The U. S. catch of fish and shellfish in 1964 (mostly for the first 11 months and in some instances various periods through December 22) was down about 449 million pounds (11 percent) as compared with 1963. The decline was chiefly in the catches of menhaden, Maine herring, shrimp,

United States Commercial Fishery Landings of Certain Species for Periods Shown, 1964 and 1963

Species	Period	1/1964	1963	Total 1963
. . . (1,000 Lbs.) . . .				
Cod:				
Maine	9 mos.	2,100	1,661	1,960
Mass. 2/	11 "	25,600	30,212	31,475
Total cod		27,700	31,873	33,435
Flounder:				
Maine	9 mos.	1,000	1,115	1,216
Mass.	11 "	85,400	85,580	91,881
Total flounder		86,400	86,695	93,097
Haddock:				
Maine	9 mos.	2,400	2,086	2,877
Mass. 2/	11 "	107,600	102,024	106,075
Total haddock		110,000	104,110	108,952
Halibut: 3/				
Alaska	Year	16,800	22,372	22,372
Wash. and Oregon	Year	9,000	11,871	11,871
Total halibut		25,800	34,243	34,243
Herring, Maine	Year	60,000	152,317	152,317
Industrial fish				
(Me. & Mass.) 4/	11 mos.	30,800	47,661	47,897
Mackerel:				
Jack 5/	10 mos.	62,700	84,538	98,078
Pacific 5/	10 "	33,200	30,986	36,974
Menhaden	Year	1,463,000	1,815,798	1,815,798
Ocean perch:				
Maine	9 mos.	45,300	51,229	63,905
Mass.	11 "	29,500	42,109	44,387
Total ocean perch		74,800	93,338	108,292
Pollock:				
Maine	9 mos.	1,000	2,065	2,389
Mass. 2/	11 "	9,200	9,182	10,727
Total pollock		10,200	11,247	13,216
Salmon:				
Alaska	Year	312,000	223,063	223,063
Washington	9 mos.	16,100	48,761	54,993
Sardine, Pacific	to Dec. 22	12,200	7,034	7,131
Scallops, sea, New Bedford (meats)	11 mos.	12,200	15,291	15,941
Shrimp (heads-on), So. Atl. & Gulf	Year	193,200	218,645	218,645
Tuna, Calif.	to Dec. 19	272,100	273,760	285,416
Whiting:				
Maine	9 mos.	25,300	15,942	15,942
Mass.	11 "	47,800	64,477	66,770
Total whiting		73,100	80,419	82,712
Total all above items. . . .		2,875,500	3,359,779	3,430,200
Other 6/		677,200	642,141	1/1,409,800
Grand total		3,552,700	4,001,920	1/4,840,000

1/Preliminary.

2/Landed weight.

3/Dressed weight.

4/Excludes menhaden.

5/Cannery receipts.

6/Includes landings for species not listed.

Note: Finfish generally converted to round weight, crustaceans to weight in the shell, and mollusks reported in meats only.

jack mackerel, and Atlantic ocean perch. Landings of industrial fish were down 339 million pounds and food fish down 110 million pounds.

Menhaden: Landings in 1964 totaled 1.5 billion pounds--353 million pounds less than in the same period of 1963. Landings were down along both the Atlantic and Gulf Coasts, with heaviest losses in the Middle Atlantic area.

Salmon: It is estimated that the 1964 catch in Alaska was about 312 million pounds--an increase of 89 million pounds (40 percent) as compared with 1963. Landings of all species



Fig. 1 - Fishing fleet in a West Coast fishing port.



Fig. 2 - Washing a fish-pot catch at Cape May, N.J.

increased, with red, pink, and chum accounting for most of the gain.

Shrimp: The 193 million pounds landed in the South Atlantic and Gulf States in 1964 were 26 million pounds (12 percent) less than in the previous year.

Tuna: Landings of 272 million pounds in California to December 19, 1964, were scarcely 2 million pounds less than during the same period in 1963. In 1964, a 20-million-pound loss in the combined catch of albacore, bluefin, and skipjack tuna was largely offset by increased landings of yellowfin.

Maine herring: Production of Maine herring was only 60 million pounds in 1964--a decline of 92 million pounds (61 percent) as compared with 1963.

Ocean perch: During the first 11 months of 1964, landings in Massachusetts totaled 30 million pounds (down 12 million from the previous year); while Maine landings for the first 9 months of 1964 were 45 million pounds--a decline of 6 million pounds.

Mackerel: Landings through October 1964 were 63 million pounds--a decline of 22 million pounds as compared with the same period of 1963; while Pacific mackerel landings through October 1964 totaled 33 million pounds--a 2-million-pound gain.



U. S. Fishing Vessels

FIRST APPLICATION UNDER NEW FISHING FLEET IMPROVEMENT ACT:

The first application under the new Federal law to assist commercial fishermen in the construction of modern fishing vessels was received from the firm, Boat Pat-San-Marie, Inc., New Bedford, Mass., the U. S. Department of the Interior announced December 24, 1964. That new law--The Fishing Fleet Improvement Act of 1964--provides financial assistance to help offset the higher cost of vessel construction in United States shipyards compared to a representative foreign shipyard. The maximum assistance cannot exceed 50 percent of the domestic cost.

The Massachusetts firm proposes to order from a United States builder a 100-foot all-steel vessel to fish for scallops, ground-fish, and flounders.

To qualify for assistance under the Fishing Fleet Improvement Act a proposed vessel must be of advanced design, capable of fishing in expanded areas, and be equipped with newly developed gear. The vessel may not operate in a fishery if such operation would cause economic hardship to efficient vessel operators already operating in that fishery.

As required under the law, a notice was published in the Federal Register announcing a hearing on the application January 25, 1965. Hearings are announced on each application to allow any person who feels he may suffer economic hardship to present evidence demonstrating how he would be injured if the financial assistance were granted.



U. S. Foreign Trade

AIRBORNE IMPORTS OF FISHERY PRODUCTS, AUGUST-SEPTEMBER 1964:

Airborne fishery imports into the United States in August 1964 held fairly steady in comparison to the previous month, but declined in September mainly because of lower shrimp imports from Venezuela.

Total airborne shrimp imports in August 1964 were 1,103,100 pounds, the bulk of which consisted of fresh and frozen raw headless shrimp. Total airborne shrimp imports in September 1964 were 784,500 pounds. About 99 percent of the airborne shrimp arrivals in August and September 1964 entered through the Customs District of Florida. The remainder entered through the Customs Districts of Arizona,

U. S. 1/Airborne Imports of Fishery Products, January-September 1964 with Comparative Data									
Product and Origin 2/	1964		1964		1964		1963		
	August		September		Jan.-Sept.		Jan.-Sept.		
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/	
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	
Fish:									
Mexico	32.3	4.5	12.3	1.2	313.7	64.0	225.6	63.9	
British Honduras	-	-	-	-	1.8	0.4	38.8	9.7	
Honduras	-	-	-	-	-	-	16.5	4.3	
Japan	-	-	-	-	-	-	2.0	8.2	
United Kingdom	-	-	0.1	0.3	2.0	3.9	2.2	5.2	
Iran	0.1	0.4	0.1	0.3	0.2	0.7	1.2	7.4	
France	-	-	-	-	4.3	7.8	5.2	6.1	
Rumania	-	-	-	-	0.9	9.0	-	-	
Venezuela	-	-	-	-	4.6	1.7	-	-	
U.S.S.R.	-	-	-	-	-	-	26.8	70.2	
Denmark	-	-	0.5	0.5	1.5	2.8	-	-	
Canada	-	-	-	-	14.8	4.8	-	-	
Spain	1.8	0.9	2.1	1.0	7.8	5.2	-	-	
Other countries	0.5	0.5	0.5	0.6	4.8	3.8	1.7	0.7	
Total fish	34.7	6.3	15.6	3.9	356.4	104.1	320.0	175.7	
Shrimp:									
Guatemala	-	-	-	-	-	-	141.6	74.0	
El Salvador	-	-	-	-	159.1	96.8	233.6	157.1	
Honduras	-	-	-	-	10.3	3.8	99.8	52.3	
Nicaragua	1.4	0.8	-	-	79.6	45.6	448.7	142.1	
Costa Rica	46.5	23.3	46.5	23.3	296.1	161.2	509.8	242.8	
Panama	98.6	58.1	145.2	90.2	812.8	499.1	1,350.7	722.5	
Venezuela	955.7	463.2	591.5	307.9	4,671.2	2,202.4	3,999.4	1,877.6	
Ecuador	-	-	-	-	-	-	111.6	39.4	
France	-	-	-	-	-	-	2.6	0.9	
British Guiana	-	-	-	-	10.5	5.2	-	-	
Mexico	0.9	0.6	1.2	0.8	2.1	1.4	13.2	6.9	
Other countries	-	-	0.1	0.1	12.1	5.2	-	-	
Total shrimp	1,103.1	546.0	784.5	422.3	6,053.8	3,020.7	6,911.0	3,315.6	
Shellfish other than shrimp:									
Mexico	1.8	1.7	3.6	3.4	14.4	9.9	92.2	53.5	
British Honduras	96.2	100.4	20.1	12.5	207.3	165.5	246.8	199.6	
El Salvador	-	-	-	-	-	-	5.0	3.6	
Honduras	-	-	53.5	68.0	72.9	78.7	5.5	3.3	
Nicaragua	-	-	-	-	50.5	40.0	145.9	89.0	
Costa Rica	9.3	4.7	-	-	18.6	14.2	73.8	60.1	
Jamaica	-	-	9.3	13.4	52.9	49.6	51.0	40.1	
Netherlands	-	-	-	-	-	-	32.8	20.9	
Antilles	-	-	-	-	-	-	8.0	21.7	
Colombia	4.8	4.8	-	-	4.8	4.8	2.2	1.8	
Ecuador	-	-	-	-	-	-	0.8	0.9	
Tunisia	-	-	-	-	-	-	1.7	0.3	
British Guiana	-	-	-	-	14.5	3.2	17.7	6.0	
Canada	-	-	-	-	312.9	173.4	213.3	109.2	
Venezuela	-	-	-	-	-	-	13.7	6.0	
Dominican Rep.	5.1	2.2	2.0	0.4	16.2	4.7	22.2	20.9	
Bahamas	-	-	-	-	10.6	6.8	5.3	5.2	
Haiti	0.8	0.4	-	-	7.8	4.2	-	-	
Other countries	-	-	-	-	0.6	0.7	7.5	6.3	
Total	118.0	114.2	88.5	97.7	784.0	555.7	927.7	642.4	
Grand total	1,255.8	666.5	888.6	523.9	7,194.2	3,680.58	1,587.4	1,333.7	

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included, but United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/F.o.b. point of shipment. Does not include U.S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: *United States Airborne General Imports of Merchandise*, FT 380, September 1964, U.S. Bureau of the Census.

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Source: United States Airborne General Imports of Merchandise, FT 380, September 1964, U.S. Bureau of the Census.

Puerto Rico, and New Orleans (La.) in August 1964, and through the Customs Districts of Arizona, New York (N.Y.), and Puerto Rico in September 1964. Spiny lobsters from British Honduras were the main shellfish item other than shrimp imported by air in August 1964. In September, spiny lobster tails from Honduras were the principal item other than shrimp imported by air.

Fish fillets from Mexico accounted for the bulk of the airborne finfish imports in both August and September 1964.

Total airborne fishery imports in January-September 1964 were down 11.8 percent in quantity and 11.0 percent in value from those in the same period of 1963. The decline was due to smaller shipments of shrimp and spiny lobsters from Central and South American countries.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-November 28, 1964, amounted to 42,801,114 pounds (about 2,038,148 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. This was substantially less (11.2 percent) than the 48,238,342 pounds (about 2,297,064 standard cases) imported during January 1-November 30, 1963.

The quantity of tuna canned in brine which could be imported into the United States during the calendar year 1964 at the $12\frac{1}{2}$ -percent rate of duty was limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota were dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, OCTOBER 1964:

United States imports of processed edible fishery products in October 1964 were up 13 percent in quantity and 19 percent in value from those in the previous month. The increase was due mainly to higher imports of frozen groundfish fillets and blocks from Canada and Iceland. Among the canned items, imports in October were up for canned tuna and canned oysters, but down for canned sardines not in oil and canned crab meat.

Compared with the same month in 1963, imports in October 1964 were up 4 percent in quantity and 6 percent in value. The increase was due mainly to larger imports of canned albacore tuna from Japan, frozen ocean perch fillets from Canada, and groundfish blocks from Canada, Iceland, and Greenland. The increase was partly offset by lower imports of canned sardines in oil, canned salmon, canned crab meat, and canned oysters.

In January-October 1964, imports were up 1 percent in quantity and 5 percent in value from those in January-October 1963. During January-October 1964, there were larger imports of groundfish blocks (increase mainly from Canada and Iceland), ocean perch fillets, flounder fillets, yellow pike fillets, sea catfish fillets, halibut fillets, and canned sardines not in oil. But there was a decline in imports of canned tuna other than albacore, canned crab meat, canned oysters, canned salmon, canned sardines in oil, swordfish fillets, and haddock fillets.

U.S. Imports and Exports of Processed Edible Fishery Products, October 1964 with Comparisons

Item	QUANTITY				VALUE			
	Oct.		Jan.-Oct.		Oct.		Jan.-Oct.	
	1964|1963	1964|1963	1964|1963	1964|1963	1964|1963	1964|1963	1964|1963	1964|1963
	.. (Millions of Lbs.)				.. (Millions of \$)			
Fish & Shellfish:								
Imports ^{1/}	55.2	53.0	447.9	441.6	16.8	15.9	135.2	128.9
Exports ^{2/}	4.6	3.6	38.3	26.5	3.1	2.1	20.3	12.7

^{1/}Includes only those fishery products classified by the U.S. Bureau of Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

^{2/}Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in October 1964 were down 18 percent in quantity and 21.0 percent in value from the high level of shipments in the previous month. Canned salmon exports continued heavy. Shipments of canned salmon totaling 2.7 million pounds in October 1964 were down only 9 percent from the previous month. There was some decline in exports of canned sardines not in oil, but exports of canned shrimp were up.

Compared with the same month of 1963, the exports in October 1964 were up 28 percent in quantity and 48 percent in value. The increase was due mainly to larger shipments of canned salmon. Exports were also up for canned sardines not in oil, but exports were down for canned mackerel, canned shrimp, and canned squid.

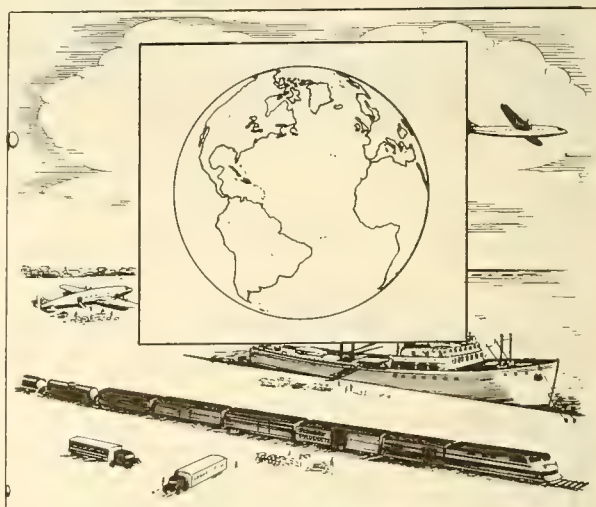
Processed fish and shellfish exports in the first 10 months of 1964 were up 44 percent in quantity and 60 percent in value from those in the same period of 1963. In January-October 1964 there were much larger shipments of canned mackerel and canned salmon. Exports of canned shrimp and canned sardines in oil were also higher, but exports of canned sardines not in oil and canned squid were down.

Note: See Commercial Fisheries Review, January 1965 p. 50.

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FISHERY PRODUCTS, 1963:

U. S. foreign trade in fishery products was valued at a record \$547 million in 1963, an increase of \$27 million as compared with 1962. Imports for consumption amounted to \$491 million and exports more than \$56 million. The value of imports was nearly \$6 million more than in 1962, while exports increased \$21 million.

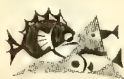


Imports of edible fishery products in 1963 totaled 1.2 billion pounds valued at \$395 million. Compared with 1962, this was a decrease of 5 percent in quantity and 2 percent in value. The loss in quantity was due chiefly to decreases in the imports of fresh and frozen tuna, sea herring, and canned sardines. Total

volume of imports of edible products would have been lower had not imports of groundfish fillets and blocks, shrimp, and sea scallop meats remained at record levels. Other important edible items received in considerable quantity in 1963 were fresh and frozen halibut, tuna loins and discs, fillets (other than groundfish), lobsters (common and spiny); canned tuna in brine; and pickled or salted cod, haddock, hake, pollock, and cusk.

Imports of nonedible fishery products were valued at \$96 million in 1963--15 percent more than in 1962. Increased receipts of fish meal and scrap (376,000 tons valued at \$37 million) largely accounted for the gain in value. Fish meal accounted for nearly 39 percent of the value of all imported nonedible fishery products in 1963. Other important items were cultured and natural pearls (\$18 million) and fish and marine animal oils (\$8 million).

Exports of domestic edible fishery products totaled 64.7 million pounds valued at \$30.4 million--an increase of 15 percent in quantity and 35 percent in value compared with the previous year. The gain was due to exporting greater quantities of fresh and frozen salmon and shrimp. Exports of nonedible domestic fishery products valued at \$26.2 million were nearly double the value of the 1962 exports (\$13.3 million). The increase was due to the record exports of 262.3 million pounds of fish oils. Nearly 76 percent of 1963 exports of oils were sent to Sweden, United Kingdom, and West Germany. Exports of foreign-produced fishery products during 1963 amounted to \$8.5 million compared to \$4.4 million in 1962.



Vessels

NEW OCEANOGRAPHIC RESEARCH VESSEL

"DAVID STARR JORDAN" LAUNCHED:

The newest vessel in the U. S. Bureau of Commercial Fisheries growing research fleet, the David Starr Jordan, was launched December 19, 1964, at Sturgeon Bay, Wis.

Completion of the David Starr Jordan is expected in May 1965. It will replace the 35-year-old Black Douglas at the Bureau of Commercial Fisheries Fishery-Oceanography Center at La Jolla, Calif. The new vessel

honors the late David Starr Jordan, America's most prominent ichthyologist and the first president of Stanford University. After completion, the \$1.8 million vessel will travel to La Jolla via the Great Lakes, St. Lawrence Seaway, and the Panama Canal.



Artist's conception of the Bureau of Commercial Fisheries' newest research vessel, David Starr Jordan, launched December 19, 1964.

The David Starr Jordan is an all-welded steel vessel, 171 feet long with a 37-foot beam and 11-foot draft. It is powered by twin Diesel engines of more than 500 horsepower each. The David Starr Jordan will have a cruising speed of 12 knots and will be capable of remaining at sea up to 40 days. The cruising range will be more than 8,000 miles.

More than one-third of the vessel's enclosed space will be devoted to laboratories and support areas. It will have laboratories for biological specimens, hydrography, water chemistry, radioactive substances, and sonar surveying. The David Starr Jordan will have accommodations for 13 scientists and 22 crew members.

Additional features include underwater observation stations fore and aft and two 450-cubic-foot wells for live specimens. A unique bow propulsion system will enable the vessel to be pivoted in any direction and, when used in combination with the main engines, will move the ship sideways.



Virginia

MARINE SCIENCE TRAINING PROGRAM FOR TEACHERS AND STUDENTS:

The National Science Foundation has awarded grants amounting to \$33,740 to the Virginia Institute of Marine Science, according to the

Director of the Gloucester Point (Va.) research facility. The funds will be used during the summer of 1965 to conduct a marine science training program for 6 college teachers and 10 undergraduate students.

One grant will support a Research Participation for College Teachers Program and will give six teachers holding the Ph. D. degree an opportunity to use the research facilities at Gloucester Point. Teachers accepted into the program may engage in independent work or may participate in research activities in progress at the Institute. They will be under the supervision of experienced scientific investigators and their work will be related to marine problems of the Chesapeake Bay area. In order to be eligible for the program a teacher must be a full-time faculty member in some university or college in the continental United States. Each will give full time to research for 12 weeks June 14-September 3, 1965.

The Undergraduate Research Participation Program will fund the training of 10 students from colleges and universities of the continental United States who are interested in a career in marine research. They will be given an opportunity to work on research programs in progress and to perform a small research problem of their own under the direction of research personnel at the Virginia Institute. Preference will be given to students who have completed at least two years of college, and have definite ideas about the research they wish to undertake. Their program will extend from June 14-August 21, 1965.

Note: Both college teachers and undergraduates who are interested in securing information about either of the programs should write to: Robert S. Bailey, Director, NSF Programs, Virginia Institute of Marine Science, Gloucester Point, Va. 23062. All applications must be completed by March 1, 1965. (Virginia Institute of Marine Science, December 28, 1964.)



Whales

PACIFIC COAST CATCH, 1964:

The 1964 whaling season on the Pacific Coast closed November 30, 1964. The 2 California stations took a total of 253 whales in 1964 compared with 254 in 1963. The catch by species for those stations for 1963 and 1964 was:

Whale Species	1964	1963
	(No.)	
Sperm	63	77
Humpback	27	55
Finback	147	16
Sei	13	97
Blue	2	6
Bottlenose	1	2
Killer	0	1

The Oregon whaling station took only 1 whale in 1964 as compared with 5 in 1963.

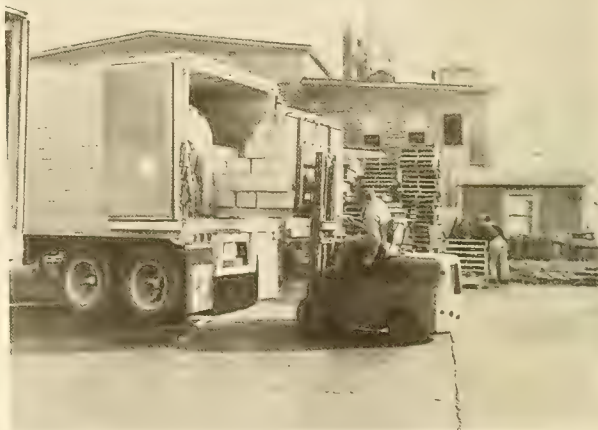


Wholesale Prices

WHOLESALE PRICES FOR EDIBLE FISH AND SHELLFISH, DECEMBER 1964:

Lower prices for ex-vessel haddock and shucked oysters from November to December 1964 were responsible for a 0.6-percent drop from the previous month in the overall wholesale price index for edible fish and shellfish (fresh, frozen, and canned). All other prices for fresh and frozen fishery products listed in the December 1964 index were higher than in the previous month, but those for canned fish remained unchanged. At 109.5 percent of the 1957-59 average, the index in December 1964 was 1.9 percent higher than in the same month of 1963.

The subgroup index for drawn, dressed, or whole finfish dropped 0.5 percent from November to December solely because of lower prices at Boston for ex-vessel large haddock (down 7.7 percent); compared with December 1963 those prices were lower by 25.2 percent. December prices at New York City rose from the previous month for frozen dressed western halibut (up 5.2 percent because of substantially lower inventories) and Great Lakes round yellow pike (up 7.7 percent). As compared with December 1963, the subgroup index in December 1964 was lower by 2.8 percent--haddock prices were considerably lower; there was a slight drop in prices for frozen dressed king salmon; but prices for other items in the subgroup were substantially higher.



Loading a trailer with frozen fish products.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1964 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Dec. 1964	Nov. 1964	Dec. 1964	Nov. 1964	Oct. 1964	Dec. 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.5	108.9	111.6	107.5
Fresh & Frozen Fishery Products:					113.8	113.0	116.6	110.5
Drawn, Dressed, or Whole Finfish:					111.2	111.7	133.4	114.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.14	99.5	107.8	135.5	133.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.38	118.3	112.4	164.1	96.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.83	115.6	115.6	134.1	118.4
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.51	.50	76.1	74.6	79.8	61.2
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.70	.65	114.6	106.4	77.8	83.5
Processed, Fresh (Fish & Shellfish):					111.9	111.1	106.5	111.5
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.45	.44	109.3	106.9	97.1	138.4
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.90	.88	105.5	102.5	96.7	95.5
Oysters, shucked, standards	Norfolk	gal.	7.13	7.25	120.1	122.2	120.1	126.5
Processed, Frozen (Fish & Shellfish):					112.8	110.8	104.7	101.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.37	.35	92.5	88.7	91.2	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.40	.39	115.8	112.9	109.9	115.8
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.30	105.2	103.4	103.4	121.0
Shrimp, lge. (26-30 count), brown, 5-lb. pkg. .	Chicago	lb.	.96	.95	113.8	112.7	103.2	91.9
Canned Fishery Products:					102.2	102.2	103.1	102.5
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. .	Seattle	cs.	21.25	21.25	92.6	92.6	94.8	102.4
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	98.2
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	97.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	114.9

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

The subgroup index for processed fresh fish and shellfish in December 1964 rose 0.7 percent from the previous month, but was down 0.4 percent as compared with December 1963. December prices were higher at Boston for fresh haddock fillets (up 2.2 percent) and at New York City for fresh South Atlantic shrimp (up 2.9 percent). Those were offset by a 1.7-percent drop in prices for shucked standard oysters. As compared with the same month a year earlier, fresh shrimp prices in December 1964 were 10.5 percent higher but were partly cancelled out by lower prices for other items in the subgroup.

Most products in the processed frozen fish and shellfish subgroup were higher-priced in December 1964 and the index rose 1.8 percent from the previous month. Prices for frozen flounder fillets were up 4.3 percent from November to December, but were 6.5 percent below those in December 1963. Price increases in December 1964 for other species of frozen fillets were nominal. Frozen shrimp prices (up 1.0 percent) at Chicago advanced slightly from the previous month but those prices were 23.8 percent higher than in December a year earlier. As compared with the same month

in 1963, the subgroup index in December 1964 was 11.4 percent higher because of a much stronger market for frozen shrimp.

Prices for canned fishery products were mostly steady in December 1964 and there was some indication of improvement in the market outlook for canned pink salmon. Prices in that month for all canned fish items in the subgroup were the same as in the previous month and there was no change in the index. Except for pink salmon, prices for other canned fishery products in the subgroup--tuna, jack mackerel, Maine sardines--remained unchanged from October through December 1964. The 1964 Alaska pack of pink salmon was up nearly 20 percent from the previous year's pack but the new Maine sardine pack was substantially lower than that canned the previous season. The December 1964 subgroup index was only slightly lower (down 0.3 percent) than in the same month a year earlier. Although prices in December 1964 were higher for most of the canned fish items, those for pink salmon were down 9.6 percent from the same month in 1963.





International

FISH OIL

WORLD EXPORTS, JANUARY-JUNE 1963-64:

Exports of fish and fish-liver oils from the major exporting countries totaled 198,700 short tons in January-June 1964, down 11 percent from the 223,500 tons exported by the same countries in January-June 1963. The major exporting countries shown in the table below accounted for 92 percent of total estimated world trade in fish oil during 1963.

Gross Exports of Fish and Fish-Liver Oils from Selected Countries, January-June 1964 with Comparisons			
Country	Jan. - June		1/1963
	1/1964	1/1963	
. . (1,000 Short Tons) . .			
Canada	7.6	2.4	6.4
United States	28.1	48.9	131.2
Chile	5.3	11.4	12.7
Peru	76.0	82.2	121.3
Denmark	14.5	9.0	22.9
West Germany	6.0	8.3	19.7
Iceland	17.5	22.4	71.2
Portugal	3.6	6.0	10.5
Angola	5.1	1.8	3.4
Morocco	1.8	2.9	5.7
South Africa Republic (incl. S.-W. Africa)	33.2	28.2	35.3
Total	198.7	223.5	440.3
1/Preliminary.			

The United States, Peru, Chile, and Iceland were primarily responsible for the decline in fish oil shipments. Among the countries to register an increase in shipments during the January-June 1964 period were Denmark, South Africa, Canada, and Angola. (Foreign Agriculture, U. S. Dept. of Agriculture.)

FISHING VESSELS

INTERNATIONAL MEETING ON WOODEN FISHING VESSEL DESIGN AND CONSTRUCTION:

An International Meeting on Structural Research on Wooden Fishing Vessels was held September 15-18, 1964, in Copenhagen, Denmark, with 40 participants from 15 countries. The Meeting was convened by the Danish Wood Council in cooperation with the Fishing Boat Section of the Food and Agriculture Organization.

Subjects discussed at the Meeting included:
(1) functional demands and strength require-

ments for fishing vessels; (2) principles of design specially concerning smaller fishing vessels; (3) methods of constructing wooden fishing vessels; and (4) materials used in wooden shipbuilding.

The participants agreed that careful consideration should be given to new design principles, such as shell construction, with a view to simplifying the construction of strong vessels. In this respect, the influence of hull shape on the strength of vessels was stressed. During the discussion of fishing vessel construction it was pointed out that cost was an important factor as to whether improved construction methods proposed by experts could be adopted.

The Meeting considered at some length the problems of bent-frame construction versus sawn-frame and laminated-frame construction methods. A floor discussion among the participants at the Meeting revealed that national preferences play an important part in wooden fishing vessel construction methods. Bent-frame construction is well established in the United States and Canada, but builders in other countries have some reservations about its use. Nevertheless, considerable interest was shown in the possibility of lowering hull construction costs by the use of bent-frame construction. The use of laminated frames was generally favorably commented upon. Laminated frames may not reduce costs in those countries where bent-frame construction is well established for vessels under 80 to 100 feet in length. But in Norway, which has traditionally used sawn-frame construction, good results are being obtained with laminated framing for vessels in the 50-foot range.

The main theme of the Meeting concerned research on scantling schedules for vessels. Those schedules set forth the size of structural materials required in a vessel in order for it to have seaworthy rating. In the past, scantling schedules have usually been related to the dimensions of a vessel and there has

Note: See Commercial Fisheries Review, Sept. 1964 p. 64.

France had originally notified the Commission it was unable to conform to the Commission Decision. In defending their inability to live up to the Decision, the French stated the inequalities of social and safety regulations for the fishing trade. The French were given some additional time in which to explain their views but the Commission subsequently rejected the French request to postpone the application of the EEC fishery directive allowing direct importation of the catch of Member State fishing vessels into any EEC

CEE

EWG

EEG

D.D.5

CERTIFICAT DE CIRCULATION DES MARCHANDISES
CERTIFICATO PER LA CIRCOLAZIONE DELLE MERCI

WARENVERKEHRSBESCHEINIGUNG
CERTIFICAT INZAKE GOEDERENVERKEER

A 000000

A. ATTESTATION DE LA DOUANE

Le fonctionnaire des douanes soussigné certifie que les condamnations prévues par la législation sont réunies pour que les produits péchés et, le cas échéant, traités enroutés par le navire désigné ci-après.

Nom et type
du navire :

Numéro d'enregistrement
ou d'immatriculation :

Port d'attache
ou d'armement :

Armateur :

sont considérés comme originaires de

(Sur navire)

au sens de l'article 9, § 2, du Traité.

Bureau de douane de

Cachet
du
bureau

Le

19

(Signature d'accommodaire)

B. DECLARATION DU CAPITAINE

Je soussigné

(nom et prénom)

capitaine du

(nom du navire)

declare que les produits désignés ci-après

Nombre et nature des emballages (1)	Désignation des produits	Poids brut

ont été péchés par ledit navire.

L'établissement du présent certificat a été relaté à la page du livre de bord.

fait à le 19

(Signature du capitaine)

(1) Le mot "emballage" inclut, en outre,

For Community trade in fishery products, the European Common Market had previously been unable to adopt a common fishery policy. However, by the application of the Rome Treaty intra-Community trade has been liberalized by tariff reductions and by the total elimination of quotas on most fish or fish products, or at least enlargement of the few remaining quotas under Article 33-34 of the Rome Treaty. This means that intra-Community trade has a preference over external fish imports. In order to be designated as fish for which Community treatment is to be applied, each Community fishing vessel up to now has had to return to a port of its home country and obtain a customs statement. With this statement the fishing vessel can then go and sell its fish catch in any Member State port.

International (Contd.):

Certain Community fishing interests--French tuna fishing vessels selling to Italy, Dutch herring fishermen selling to France, and German frozen fish block factoryships--all wanted to be able to go directly to other Member State ports without first stopping in their home countries to get the necessary certificates of origin. The present decision allows fishing vessels to present a specified form (Form D.D.5) and obtain Community treatment for their fish. The fish may be "either as is, or after having been subjected to a simple process to ensure preservation." Germany has requested the Commission to define broadly the meaning of that descriptive phrase, but the Commission has not acted on it. The Decision includes warehousing in associated States or territories: Greece, Turkey, and the African Associated States, etc.

Form D.D.5 only gives the fish or fish products the right of entry and Community treatment. It does not change any other Member State fishery laws or practices, so that the catches so entering cannot obtain the right to be sold at the fish auctions of unloading ports and are subject to embargoes under national minimum price plans. France notified the Commission in early September that imports of herring would be stopped when the price goes below the French minimum price. Thus catches entering another Common Market Member State port must be ordered in advance for it to be worth a captain's risk to unload there.

The Decision made by the EEC Commission is limited and a common fishery policy does not seem about to happen. A Commission source indicates they do have a general outline of a common fishery policy, but the most encouraging element was the probability of appointing a new director just for fishery matters.

In the discussion with the French on this matter, the Commission promised to attempt to accelerate the work on a common fishery policy. (United States Mission to European Communities, Brussels, November 20, December 8 and 9, 1964.)

GREAT LAKES FISHERY COMMISSION

EXTENSION OF SEA LAMPREY CONTROLS APPROVED:

A program to complete sea lamprey control treatment of streams feeding into Lake

Michigan and for preparations to extend it to Lake Huron tributaries has been approved by the Great Lakes Fishery Commission which met at Washington, D. C., December 2-3, 1964, for a two-day interim meeting. The Commission is made up of three members each from Canada and the United States.

Donald L. McKernan, Chairman of the Commission and Director of the U. S. Bureau of Commercial Fisheries, said lampreys in Lake Superior have been reduced by about 80 percent as a result of stream treatment with selective chemicals. He recommended that research agencies study the desirability of allowing a limited commercial lake trout fishery in Lake Superior in the near future.

Lake trout, prized by both sport and commercial fishermen, were virtually eliminated by sea lampreys in Lake Huron in the 1940's and in Lake Michigan in the 50's. The lake trout in Lake Superior had fallen to dangerously low levels when stream treatment to destroy young lampreys was started in 1958.

Scientists reported a further decrease in lamprey attacks on lake trout in Lake Superior in the fall of 1964, and also described a widespread resumption of spawning which had been negligible since 1959 because of the scarcity of mature trout.

The Commission's chairman emphasized that scientists should continue to seek inexpensive chemicals effective against lampreys, but even less toxic to other organisms than chemicals presently known. He urged them to seek solutions which dissipate rapidly in water without contributing to pollution. He said that although problems in the upper Great Lakes are considerable, the Commission must direct more attention to fishery problems in Lakes Erie and Ontario.

It was also announced that the Governments of Canada and the United States have each agreed to appoint an additional member to the Commission to better represent interests in the lower lakes.

The Great Lakes Fishery Commission was established by Canada and the United States in 1955 and is responsible for the joint program to control sea lamprey and for recommending other measures to improve commercial and sport fishing in the Great Lakes.

Note: See Commercial Fisheries Review, February 1964 p. 62.

International (Contd.):

KING CRAB

ALASKAN FISHERY GIVEN PROTECTION BY NEW UNITED STATES-SOVIET AGREEMENT:

The United States and the Soviet Union on December 14, 1964, concluded an agreement relating to fishing operations in the Northeast Pacific Ocean. The agreement is designed to minimize damage by Soviet trawlers to the fishing gear of United States king crab fishermen in the Kodiak Island area of Alaska.

The agreement was recommended to the two governments by delegations of the two countries following discussions in June 1964 at Juneau, Alaska. It provides for the establishment of a number of areas in the vicinity of Kodiak Island (where United States king crab pots are concentrated) in which mobile gear (trawls used by the Soviets to catch bottom-fish) will not operate during the period July-October, inclusive. The agreement establishes procedures for amending, by mutual agreement between the Chief of the Soviet fishing fleet and local United States fishery officials, the boundaries of those areas or the periods during which they are reserved for fixed gear. It also provides for establishing new such areas by mutual agreement.

The agreement establishes in addition a system of direct radio communication between the Soviet fleet and fishery officials in Alaska. This system can be used for reporting to the Soviet fleet the positions of the United States king crab vessels outside of the areas mentioned above in order that special precautionary measures can be taken to avoid damage to them.

Under the provisions of the agreement the United States will undertake special research in cooperation with the Soviet Union in order to develop more effective means of marking and detecting fixed gear of various types.

The agreement will not prejudice existing rights of either Government.

Note: See Commercial Fisheries Review, Sept. 1964 p. 51.

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JAPAN-UNITED STATES AGREEMENT ON FISHING IN EASTERN BERING SEA:

An interim two-year agreement between Japan and the United States for fishing king crab in the Eastern Bering Sea was effected November 25, 1964, in an exchange of notes

between Japan's Ambassador to the United States and the U. S. Secretary of State.

Following the exchange of notes, the Secretary said, "For a month, representatives of Japan and the United States discussed important issues affecting the fishermen of both countries arising from the presence of a Japanese king crab fishery on the Continental Shelf of the United States in the Bering Sea. When President Johnson signed the Bartlett Act, which makes possible the enforcement of rights which now exist or may be established in the resources of the Continental Shelf, he assured Japan that we would give full consideration to her long established king crab fishery in the Eastern Bering Sea.

"I am deeply gratified that our two Governments have agreed on an interim two-year modus operandi for accommodating our separate interests. Our representatives have faced the question of conservation of the resource, how to take account of Japan's historical fishery, our different legal concepts on the Continental Shelf Convention and the interest of the United States crab fishing industry in the area previously fished predominantly by Japan. The king crab in the east Bering Sea is not the only issue upon which we have, and can be expected to have in the future, differing interests and perspectives. I consider it encouraging for the future that by mutual understanding and rational balancing of our respective national interests we have reached an agreement which is equitable and to our common benefit. . . ."

In response, the Japanese Ambassador said, ". . . The core of the problem lies in the fact that the two Governments hold fundamentally different legal positions with respect to the king crab resource in the said area. As a result of the long and patient consultation aimed at a realistic solution of the problem between two friendly nations, we have reached agreement in spite of difficulties.

"As the relationship between our two countries becomes closer and closer, we are bound to encounter many difficult problems. But, I believe that the present agreement very clearly demonstrates that, however demanding they are, these problems can be solved if we discuss matters frankly and constructively with determination and mutual understanding in the interest of firmer bond of friendship." (Department of State, November 25, 1964.)

International (Contd.):

Editor's Note: Japan's king crab catch in the Eastern Bering Sea was limited to 185,000 cases per year for the next two years. The Japanese cabinet was reported to have agreed to the proposals and ratification was imminent. The two-year agreement reduced the present Japanese catch by about 21 percent. Included in the agreement are numerous other conservation measures.

Note: See Commercial Fisheries Review, January 1965 p. 26.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

FISHERIES COMMITTEE MEETS:

The Fisheries Committee of the Organization for Economic Cooperation and Development met for its 11th Session December 7-8, 1964, in Paris. The agenda for the meeting included: (1) a study on price systems; (2) general services to the fishery industry; (3) impact of recent changes in customs duties; (4) changes in import restrictions on fish and fishery products in member countries; and (5) the 1964 and 1965 work programs.

Note: See Commercial Fisheries Review, Sept. 1964 p. 56.

INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES

PORTUGAL RATIFIES PROTOCOL CONCERNING HARP AND HOOD SEALS:

On October 2, 1964, Portugal deposited ratification of a Protocol to the International Convention for the Northwest Atlantic Fisheries of February 8, 1949. The Protocol (done at Washington, July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. The Protocol is not yet in force. (Bulletin, U. S. Department of State, November 2, 1964.)

Note: See Commercial Fisheries Review, Mar. 1964 p. 45.

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-SEPTEMBER 1963-1964:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Production and exports of fish meal by FEO countries during January-September 1964 were up substantially from the same period of the previous year. During the first 9 months of 1964, Peru accounted for about 66.7 percent of total fish meal exports reported by FEO countries.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-September 1963-1964

Country	September		Jan.-Sept.	
	1964	1963	1964	1963
... (1,000 Metric Tons) ...				
Chile	7.3	4.6	105.6	79.0
Angola	6.0	1.5	43.0	17.7
Iceland	12.3	6.1	90.1	56.6
Norway	12.8	5.6	141.9	56.6
Peru	82.2	73.3	1,098.6	881.1
So. Africa (including S. W. Africa)	18.3	20.2	168.5	125.8
Total	138.9	111.3	1,647.7	1,216.8

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-September 1963-1964

Country	September		Jan.-Sept.	
	1964	1963	1964	1963
... (1,000 Metric Tons) ...				
Chile	10.8	2.4	114.2	75.0
Angola	6.4	1.3	42.1	17.4
Iceland	15.7	13.3	102.3	77.3
Norway	12.3	14.1	146.9	102.1
Peru	49.5	47.8	1,059.4	826.7
So. Africa (including S. W. Africa)	18.3	20.8	231.4	216.1
Total	113.0	99.7	1,696.3	1,314.6



Canada

BRITISH COLUMBIA CANNED SALMON PACK, 1964:

The pack of canned salmon in British Columbia in 1964 of nearly 1.3 million cases was slightly higher than the 1963 pack and was about 2 percent more than the 1959-1963 five-year average pack of a little over 1.2 million cases.

British Columbia Canned Salmon Pack, 1959-1964

Species	1964	1/1963	1/1962	1/1961	1/1960	1/1959
(Standard Cases--48 1-Lb. Cans)						
Sockeye (red)	343,276	158,375	297,717	398,236	226,912	256,388
Spring (king)	9,033	10,000	7,174	7,927	5,935	15,703
Steelhead	1,211	771	815	979	530	871
Blueback	36,392	11,384	12,097	12,527	23,345	10,114
Coho (silver)	167,883	146,099	175,638	234,047	69,237	215,098
Pink	463,968	757,452	1,188,661	661,458	219,658	458,747
Chum (keta)	229,855	119,190	134,483	95,400	87,884	138,865
Total	1,251,618	1,203,271	1,816,585	1,410,574	633,501	1,095,786

1/ Totals are based on final revised figures.

The pack from year to year is usually dependent on the cycle years for pink and sockeye salmon. The 1964 sockeye salmon pack was more than double that for the previous year, with the chum salmon pack nearly twice as much as was packed in 1963. The 1964 pack of pink dropped about 40 percent from

Canada (Contd.):

1963 and was only about one-third the 1962 pink salmon pack of 1.2 million cases.

Note: See Commercial Fisheries Review, January 1964 p. 43.

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BRITISH COLUMBIA HERRING FISHERY LABOR DISPUTE SETTLED:

A labor dispute in the British Columbia herring fishery was settled November 19, 1964, when fishermen voted to accept a medical plan offered by processors. Fishermen and processors had already agreed on a landed price of C\$14.48 (US\$13.41) per short ton for reduction herring, or C\$2.08 (US\$1.92) more than the C\$12.40 (US\$11.49) paid for British Columbia herring going for reduction during the 1963/64 season. According to some reports, the processors have estimated that the medical plan will add between 10 and 18 Canadian cents to the landed cost of a ton of herring. (The Fisherman, Vancouver, British Columbia, November 20, 1964.)

Editor's Note: Ex-vessel prices for herring in British Columbia are not comparable to prices in certain other countries because British Columbia processors furnish much of the equipment used in the fishery.

Note: US\$1.00 equals Canadian \$1.08.

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EXPANDED FISHERY PRODUCTS INSPECTION PROGRAM PLANNED:

An expanded inspection program of the Canadian Federal Department of Fisheries to ensure consistently high Canadian fishery products was forecast by Canada's Fisheries Minister in a statement on November 23, 1964. Opening the sixth biennial meeting in Ottawa of senior field and headquarters inspection officers of the Fisheries Department, the Minister said it was necessary for Canada to have uniform standards of fishery products to bring to consumers at home and abroad the best possible quality fish. Only in this way also, he said, could Canada compete successfully in world markets.

The Minister forecast stepped-up inspection activities within the next year to help maintain uniform quality standards of fishery products from the time the fish are caught, and through the processing and distribution stages until they reach the consumer. Steps already taken to maintain high-quality fishery products from the time of catching to the consumer were outlined by the Director of the Department's Inspection Service, who pre-

sided over the four-day meetings. He said new draft regulations were already in the hands of the provinces and the fishing industry and it was hoped that further discussions on the draft regulations could be held in the next few weeks when the provinces and the industry would have an opportunity to make their observations. He pointed out that the goal of both the Department of Fisheries and the industry was to make available to the consumer the best products possible.

The Director of Inspection Service also drew attention to the part Canada is playing in bringing about uniform world standards of fishery products through the Codex Alimentarius Commission, under the joint auspices of the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) of the United Nations. Although Canada has one of the most progressive inspection programs in the world there was still much to be done, he added. International representation at the opening sessions of the meeting included the Director of Inspection, Department of Fisheries, Copenhagen, Denmark; the Assistant Director, Bureau of Standards, Pretoria, South Africa; and the Chief of Inspection, U. S. Bureau of Commercial Fisheries, Washington, D. C., as well as technologists of that Bureau's Technological Laboratory, Gloucester, Mass.

Following the opening session, various sub-committees were formed to discuss a wide range of subjects including the qualifications for inspectors; fresh and frozen fish plant registration; dockside inspection programs and boat inspection; the icing, processing and storage of fish; and the procedures for the inspection of fishery products.

The chiefs of inspection branches of the Canadian Fisheries Department, and other inspection officers, who attended the meeting, were from Newfoundland, the Maritimes, Quebec, the Central and Pacific Areas, and also from the Fisheries Research Board of Canada's technological station, Halifax, Nova Scotia. (Press release, Canadian Department of Fisheries, Ottawa, November 23, 1964.)



Canary Islands

FISH MEAL PLANTS RESTART PROCESSING:

The fish-meal processing plants at Las Palmas, Canary Islands, reported to total

Canary Islands (Contd.):

about 7, have all recommenced operations. The plants are said to have started processing again as a result of the improved market outlook for fish meal. (Suisan Tsushin, November 20, 1964.)



Cape Verde Islands

LONG-LINERS FISH OUT OF CAPE VERDE ISLANDS TUNA BASE:

A total of 18 Japanese long-line vessels as of mid-November 1964 were fishing out of the Japanese tuna base at Sao Vicente, Cape Verde Islands. The vessels were mainly fishing off Recife, Brazil, primarily for albacore tuna, and landing about 1,000 metric tons of frozen tuna a month at the base. (Suisan Tsushin, November 19, 1964.)



Denmark

FISHERIES TRENDS--EXPORTS, LANDINGS, AND PROCESSING-- JANUARY-SEPTEMBER 1964:

Exports to all Countries: Denmark's total exports of fishery products and byproducts (other than fish oil) in January-September 1964 increased 12 percent in value over those in January-September 1963, although the total quantity of the exports was almost identical in both periods. Exports of fresh fish and frozen fish, the 2 most important categories, increased 12 percent and 22 percent, respectively, in value. Danish exporters of fishery products enjoyed a good market in the first 9 months of 1964; their main problem was a shortage of supplies to meet the good demand. Total landings in Danish ports in the first 9 months of 1964 were up only 2 percent from the same period in 1963.

Prices have been profitable for Danish fresh and frozen products. The good market for fresh and frozen cod fillets is expected to continue into 1965. Fresh cod fillets are shipped as far as Italy, Switzerland, and Austria. Frozen fillets are exported to about 60 countries. A proposal by a large European distributor of frozen fish to take the surplus daily production of fish fillets from 6 processors in Esbjerg, Denmark, is being watched with interest by other Danish firms.

A large Danish processor and exporter in Fredericia has offered Esbjerg fishermen 7.56 U.S. cents a pound for gutted and iced haddock (medium and large size). The processor is seeking daily deliveries of 22,000 to 33,000 pounds, but fishermen may not respond because the small Danish crews find it difficult to clean fish at sea.

The leading buyer of Danish fishery products in January-September 1964 was West Germany, followed by the United Kingdom. Shipments to West Germany were up 21 percent in value from those in January-September 1963 due to larger deliveries of pond trout, herring fillets, and marine fish (other than unprocessed herring). The United Kingdom received fewer direct landings by Danish vessels, but much larger shipments of Danish frozen fillets.

Exports to the United States: Denmark's total exports of fishery products and byproducts to the United States in January-September 1964 were down 39 percent in quantity and 29 percent in value from those in the same period of 1963 due

Table 1 - Danish Exports of Fishery Products to All Countries, January-September 1964 with Comparisons

Products	1/Jan.-Sept. 1964			Jan.-Sept. 1963		
	Qty.	Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Fresh fish, products	139,967	250,856	36,374	140,700	222,800	32,306
Froz. fish, products	34,691	127,349	18,466	32,500	104,400	15,138
Processed fish	2/9,164	2/46,997	2/6,815	11,200	50,100	7,265
Fish meal, solubles, ensilage, & trout food	55,690	52,030	7,544	55,100	50,200	7,279
Total	239,512	477,232	69,199	239,500	427,500	61,988
Fish oils 3/	18,161	21,197	3,074	15,600	13,300	1,929

1/Preliminary data from Ministry of Fisheries.

2/Includes the following: cured fish 2,442 tons valued at Kr. 13.9 million (\$2.0 million); canned fish 4,182 tons valued at Kr. 15.8 million (\$2.3 million); canned shellfish 902 tons valued at Kr. 7.1 million (\$1.0 million); and semipreserved fish 1,638 tons valued at Kr. 10.2 million (\$1.5 million).

3/Fish oil data are shown separately because they are sometimes delayed.

Note: Danish kroner 6.9 equal US\$1.00.

Table 2 - Danish Exports of Fishery Products to the United States, January-September 1964 with Comparisons

Product	1/Jan.-Sept. 1964			Jan.-Sept. 1963		
	Qty.	Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Fresh & Frozen:						
Fillets:						
Cod	2,154	6,729	976	4,484	13,901	2,016
Other fillets	90	393	57	135	545	79
Pond trout	346	2,685	389	562	4,399	638
Trout eggs	1	75	11	1	67	10
Flatfish 2/	228	2,020	293	110	650	94
Norway lobster	160	3,102	450	142	2,953	428
Other	3/	3	4/	9	22	3
Cured Products 5/						
Salted & smoked	27	103	15	34	73	10
Canned Products:						
Herring & sprat	434	2,133	309	401	2,182	316
Shrimp	93	950	138	130	1,228	178
Mussels	46	277	40	34	209	30
Other	25	157	23	31	154	23
Semipreserved products	12	153	22	13	140	20
Fish solubles	300	284	41	300	254	37
Total exports to U. S.	3,915	19,064	2,764	6,386	26,777	3,882

1/Preliminary data from Ministry of Fisheries.

2/Mostly turbot, brill, plaice, and sole.

3/Less than 0.5 metric tons.

4/Less than \$500.

5/Mostly cod, salmon, trout, and eels.

mainly to smaller shipments of cod fillets and pond trout. Exports of frozen cod fillets to the United States dropped because of greater demand and better prices in the United Kingdom and in Continental Europe. Exports of frozen pond trout to the United States were down because of Japanese price competition in the U. S. market, although Danish exporters are expected to re-enter selected U. S. markets. The decline in exports of frozen fishery products to the United States was partly offset by larger shipments of frozen flatfish and Norway lobster.

Danish exports of canned shrimp to the United States were down 23 percent in value and exports of canned herring and sprat were down 2 percent in value. Exports of canned herring and sprat may increase in late 1964 and early 1965 if Maine sardine canners in the United States end the 1964 season with a below-normal pack.

Denmark (Contd.):

Table 3 - Value of Danish Exports of Fishery Products by Groups and Major Countries, January-September 1964^{1/} with Comparisons

Destination	Value		Change from Jan.-Sept. 1963	
	1,000 Kr.	US\$ 1,000	Plus	Minus
By Groups:				
Common Market (EEC)	207,000	30,015	16	-
European Free Trade Assn. (EFTA-including Finland)	198,000	28,710	18	-
East Bloc countries	22,000	3,190	-	10
Other countries	50,000	7,250	-	30
Total	477,000	69,165	12	-
Major Importers by Country:				
West Germany	129,000	18,705	21	-
United Kingdom	97,000	14,065	15	-
Sweden	59,000	8,555	37	-
Italy	33,000	4,785	18	-
Switzerland	30,000	4,350	11	-
United States	19,000	2,755	-	29

^{1/}Preliminary data from Ministry of Fisheries.

Note: (1) Values do not exactly agree with those in table 1 due to rounding of figures.

(2) Fish oils not included.

Table 4 - Danish Production of Processed Fishery Products, Jan.-Sept. 1964

Product	Quantity
	Metric Tons
Canned:	
Herring & sprat	2,216
Mackerel	1,114
Other fish	3,800
Mussels	351
Other shellfish	821
Semipreserved:	
Herring & sprat	3,301
Other fish	305
Mussels	489
Fresh & frozen fillets:	
Cod	17,871
Cod-like fish 1/	1,002
Plaice	14,108
Other flatfish	787
Herring	25,584
Other fish	163
Smoked:	
Herring & sprat	1,554
Mackerel	1,486
Eels	520
Salmon & trout	345
Other fish & shellfish	152
Miscellaneous:	
Force meat 2/	1,259
Salted herring	92
Dry-salted cod	398
Other fishery products 3/	5,731
Industrial products:	
Meal	78,529
Oil	20,856
Ensilage 4/	6,106
Solubles	8,188

^{1/}Haddock, coalfish, hake, ling, etc.^{2/}Ground fish, milk, and flour.^{3/}Excluding industrial products.^{4/}Chemically treated raw fish.

Processing: The data in table 4 listing the quantities of fishery products processed in Denmark have been available only since January 1964. Comparative data for 1963 are not available. Danish export data for the first 9 months of 1964 indicate, however, that more fish were frozen, smoked, canned, and semipreserved--and more fish meal and fish oil produced--than during the same period in 1963. In January-September 1964, it appears that a higher proportion of Danish groundfish landings was processed into fresh and frozen fillets, and a smaller proportion was sold as unprocessed fresh and frozen fish. Less fish was salted and less shellfish was semipreserved.

Between one-third and one-fourth of Danish herring landings in January-September 1964 were used for food. The balance went for meal and oil.

Table 5 - Danish Fishery Landings, January-September 1964 with Comparisons

Item	Quantity	Change from Jan.-Sept. 1963	
		Plus	Minus
	Metric Tons		(Percent)
Landings in Danish Ports:			
By Danish vessels:			
Flatfish 1/	55,859	1	-
Cod	52,641	-	7
Cod-like fish 2/	38,137	-	200
Herring	256,185	23	-
Brisling	6,887	32	-
Mackerel	5,180	-	11
Eels	1,678	-	16
Salmon	777	-	59
Pond trout	6,405	12	-
Other fish 3/	196,250	-	23
Norway lobster	1,782	57	-
Shrimp	2,965	-	35
Mussels	11,058	37	-
Other shellfish	52	-	48
Starfish	2,449	151	-
Total by Danish vessels in Danish ports	638,305	-	4
By foreign vessels in Danish ports	135,739	45	-
Total landings in Danish ports	774,044	2	-
Landings in foreign ports by Danish vessels	3,649	-	6

^{1/}Plaice, flounder, dab, common sole, etc.^{2/}Haddock, coalfish, hake, ling, etc.^{3/}Mostly industrial fish such as sand eels, Norway pout, etc.

Source: Ministry of Fisheries.

Landings: Total landings of fish and shellfish in local ports by Danish fishing vessels during the first 9 months of 1964 were 4 percent less than during the same period in 1963. Heavier landings of herring, brisling, pond trout, Norway lobster, mussels, and starfish almost offset substantial decreases in industrial and cod-like fish. Landings by foreign vessels (mainly Swedish deliveries of herring) were up 45 percent. Total Danish and foreign landings in Danish ports were up 2 percent. Danish landings in foreign countries (mainly cod and plaice in the United Kingdom) dropped considerably during the third quarter of 1964.

Ex-vessel prices generally have been good. With favorable weather during the final quarter of 1964, the 1964 landings by Danish fishing craft should match or exceed those of 1963. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 11, 1964.)

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Denmark (Contd.):

AVERAGE PRICES FOR FISHERIES LANDINGS HIGHER IN JANUARY-JUNE 1964:

Prices received by Danish fishermen and vessels for landings at Danish ports were better in the first 6 months of 1964 than in 1963. This is confirmed in part by fewer complaints from fishermen, as well as the prices paid at auction and the prices fixed for industrial fish. In his speech at the opening of the 5th International Fisheries Fair at Copenhagen in September 1964, the Chairman of the Danish Fisheries Council pointed out that the higher prices made exporting of Danish fishery products more difficult. Later, in the weekly publication of the Danish Fisheries Association, a fishermen's representative concluded that most of the significant increases were in the



Fig. 1 - Wooden craft of the Danish fishing fleet being buffeted by rough weather. Most fishing vessels are smaller than 50 gross tons.



Fig. 2 - Fishing craft such as the RI 55 at the small fishing port of Hvide Sande catch mostly plaice and herring.

higher-priced species while the more common varieties showed both increases and declines. He doubted that the increases were sufficient to bring average prices to the economic level that fishermen should have. On the contrary, he believed the prices indicated that a minimum price regulation was needed as much now as earlier.

Table 1 - Comparison of Average Prices of Selected Species Received by Danish and New England Fishermen (U.S.), 1963 and January-June 1964

1963				January-June 1964			
Denmark		New England ^{1/}		Denmark		New England ^{1/}	
Name ^{2/}			Name ^{3/}	Name ^{2/}			Name ^{3/}
(U.S. Cents Per Lb.)				(U.S. Cents Per Lb.)			
<u>Cod (Torsk)</u>			<u>Cod</u>	<u>Cod (Torsk)</u>			<u>Cod</u>
live	5.33	8.21(B)	large	live	5.33	7.50(B)	large
drawn	5.39	8.05(B)	market	drawn	5.59	8.29(B)	market
dressed	5.59			dressed	5.59		
<u>Coalfish (Sei)</u>	7.76	6.07(B)	<u>Pollock</u>	<u>Coalfish (Sei)</u>	8.02	6.05(B)	<u>Pollock</u>
<u>Haddock</u>			<u>Haddock</u>	<u>Haddock</u>			<u>Haddock</u>
(Kuller)	7.83	11.49(B)	large	(Kuller)	8.02	10.05(B)	large
		10.55(B)	scrod			8.91(B)	scrod
<u>Hake (Kulmule)</u>	24.93	6.91(B)	<u>White hake</u>	<u>Hake (Kulmule)</u>	18.15	11.12(B)	<u>White hake</u>
<u>Wolffish (Havkat)</u>	8.42	8.63(B)	<u>Wolffish</u>	<u>Wolffish (Havkat)</u>	7.56	5.93(B)	<u>Wolffish</u>
<u>Halibut</u>			<u>Halibut</u>	<u>Halibut</u>			<u>Halibut</u>
(Helleflynder)	38.54	32.73(B)		(Helleflynder)	34.00	28.57(B)	
<u>Whiting</u>			<u>Whiting</u>	<u>Whiting</u>			<u>Whiting</u>
(Hvilling)	5.72	4.60(G)	H & G	(Hvilling)	6.05	4.50(G)	H & G
		2.18(G)	Round			2.31(G)	Round
<u>Dab (Ising)</u>	7.70	6.75(NB)	<u>Yellowtail</u>	<u>Dab (Ising)</u>	9.01	8.18(NB)	<u>Yellowtail</u>
<u>Witch (Skaerising)</u>	11.44	11.56(G)	<u>Gray sole</u>	<u>Witch (Skaerising)</u>	10.06	10.34(G)	<u>Gray sole</u>

Note: Comparisons are for the same or similar species.

^{1/}Prices at port of largest landings (B-Boston, G-Gloucester, and NB-New Bedford).

^{2/}English and Danish names as used in Ministry of Fisheries annual report. Species listed are landed as drawn fish unless otherwise indicated.

^{3/}U. S. names as used by U. S. Bureau of Commercial Fisheries. Groundfish are landed drawn, except hake which is dressed; flatfish are landed round; and whiting are landed headed and gutted or round.

Denmark (Contd.):

Table 2 - Average Prices for Selected Fish Species Landed at Danish Ports, 1963 and January-June 1964

Species English (Danish)	1963 January-December	1964 January-June
... (U.S. Cents Per Lb.) ...		
Angler (Havtaske)	29.93	27.03
Brill (Slethvar)	19.99	21.64
Common Mussel (Blaamussling)	.53	.39
Common sole (Tunge)	50.05	62.28
Eel (Aal)		
Silver (Blanke)	53.73	58.21
Yellow (Gule)	34.99	41.90
Eel pout (Kvabber)	9.21	9.93
Flounder (Skrubbe)	6.64	5.85
Gurpike (Hornfisk)	3.88	3.49
Herring (Sild)	3.42	3.55
Industrial (Industrifisk)	1.18	1.38
Lemon sole (Rødtunge)	17.89	20.06
Ling (Lange)	7.76	5.20
Liver (Liver)	3.29	4.08
Lobster (Hummer)		
Norway (Dybvands)	31.24	27.23
Common (Almindelige)	111.35	108.32
Lumpsucker (Stenbider)		
Male	3.55	2.57
Female	2.24	2.96
Mackerel (Makrel)	6.05	5.33
Octopus-Squid (Blaeksprutte)	15.00	12.96
Pike (Gedoe)	26.97	25.39
Piked dogfish (Pighaj)	4.67	5.99
Plaice (Rødspætte)		
Living	10.98	12.69
Drawn	10.52	13.04
Porbeagle (Siloehaj)	19.14	25.45
Rays & Skates (Rokkerskader)	10.39	12.56
Roe (Rogn)	15.13	15.59
Salmon (Laks)	121.94	129.37
Shrimp (Rejer)		
Deepwater (Dybvands)	22.23	25.78
Ordinary (Almindelige)	108.92	115.69
Sprat (Brisling)	8.55	7.37
Tunny (Tunfisk)	29.33	-
Turbot (Fogvar)	22.76	27.10
Weever (Fjaesing)	4.74	6.64

The conclusions of the fishermen's representative were based on average prices obtained from the Ministry of Fisheries. Some of the species for which average prices were higher in the first 6 months of 1964 than in

Table 3 - Percentage of Quantity and Value of Selected Species Landed at Danish Ports in 1963

Species	Quantity	Value
... (Percent) ...		
Plaice	7.3	24.2
Herring	34.9	18.2
Cod	8.3	14.3
Industrial fish (mostly sand eels, Norway pout, etc.)	34.8	12.6
Eels	0.5	6.3
Salmon	0.1	4.3
Shrimp	0.6	3.8
Whiting	6.9	2.8
Other	6.6	13.5
Total	100.0	100.0



Fig. 3 - Fish auction at Esbjerg, one of Denmark's leading fishing ports.



Fig. 4 - Bluefin tuna ready for auction at Skagen, another leading Danish fishing port. Tuna are fished mostly in the summer months.

1963 included: pollock, haddock, halibut, plaice, salmon, turbot, and shrimp.

A substantial increase in plaice prices (about 4 cents a pound) for the first 6 months of 1964 over prices for 1963 was due, in part,

Denmark (Contd.):

to the relatively low prices paid during the summer of 1963 when an unsuccessful minimum price plan was instituted and later withdrawn. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 24, 1964.)

* * * * *

RINSING WATER PURIFICATION PROCESS FOUND PROFITABLE IN FILLETING PLANT:

Purification of the rinsing water used in a Danish herring filleting plant has resulted in a very profitable yield of oil and solids. The plant operator encouraged a centrifuge manufacturer to devise the process which has been operating satisfactorily and most profitably for several months in Hirtshals, a large herring fishing and processing port in Jutland.

In machine filleting of fish there is an appreciable loss of solids during the filleting and handling processes and a substantial loss of oil if fat fish such as herring are being used. The solids and the oil are mixed in the large volume of water used for rinsing and cleaning purposes during the operation. This mixture usually is discharged into the sea and is a source of pollution.

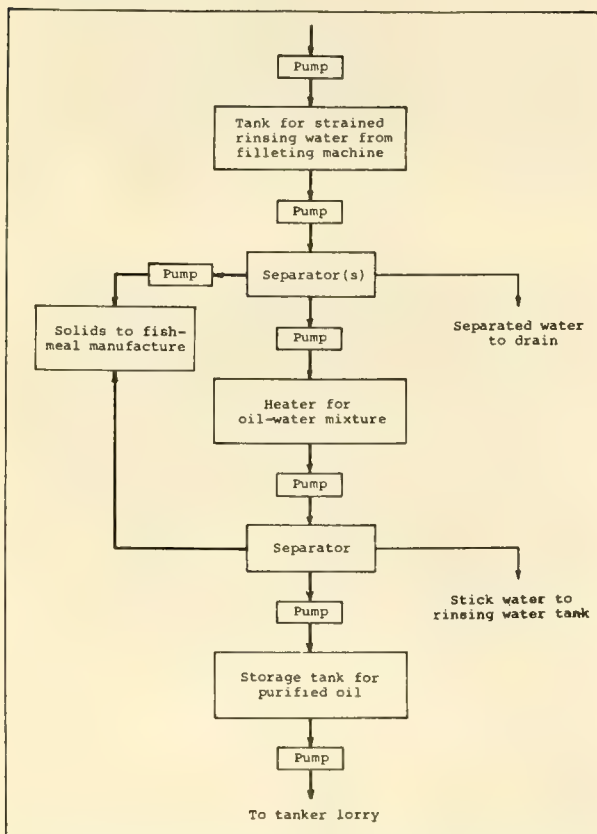


Fig. 1 - Block diagram of purification of rinsing water plant used in herring filleting factories.

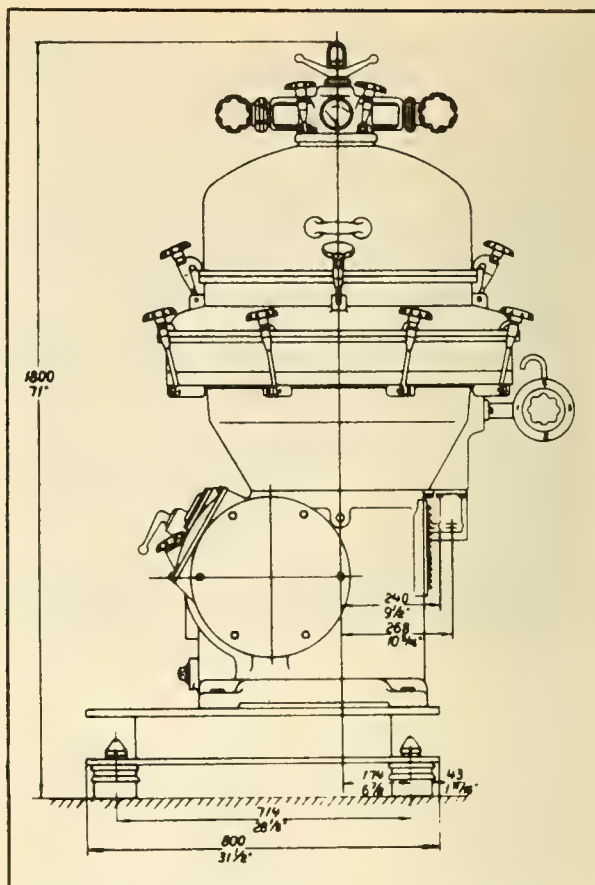


Fig. 2 - Self-cleaning separator, one of several pieces of equipment used in purifying rinsing water.

Experiments conducted in Denmark to recover oil and solids from the rinsing water resulted in a relatively simple centrifuging process. It handles a large volume of rinsing water (of which only a small portion needs to be heated) and produces readily salable oil and solids.

Process: In the process, all water and waste material are collected continuously in the plant and screened. The larger pieces of fish meat are screened out and sent to a fish-meal plant. The screened rinsing water is then pumped from the receiving tank to a centrifugal sludge separator and centrifuged without being heated. The separator produces a three-phase separation of solids, an oil and water mixture, and waste water. The solids are ejected periodically and automatically. They contain about 25 percent dry matter and are sold to a fish-meal plant which feeds them directly into its cooker. The oil and water emulsion contains about 70 percent oil. It is pumped to a tank where it is heated to 60°C. (140°F.) by a gas flame under the tank. A heat exchanger was tried but clogged quickly. Steam caused emulsions difficult to break. The waste water is discharged with about 2 percent solids and about 0.4 percent oil. (Precipitation of the protein in the waste water, using Kremodan as a precipitating agent, has been tested experimentally, but it is not yet certain that the protein precipitated could be sold for enough to make the operation profitable.)

The heated oil and water mixture is pumped to a centrifugal separator which also performs a three-phase separation. The small amount of fine solids is ejected at intervals by manual rather than automatic control, and added to the solids from the first sludge separator. The purified oil is pumped to storage. The waste water is piped back to the rinsing water tank.

Denmark (Contd.):

The sludge or wet solids produced have been sold to a fish-meal plant for the same price as industrial fish--about 18 øre a kilo (1.18 U.S. cents a pound). Since the oil comes from fresh herring it contains 1 percent or less of free fatty acids and has sold for 1.35 kroner a kilo (8.9 cents a pound) to a fish-meal plant. It is especially desirable for mixing with other fish oils to average down their much higher free fatty acid content.

The Danish filleting plant has made very substantial profits on its purification process in recent months while filleting herring. Tests showed that from herring averaging 16.5 percent oil, the purification process recovered from the rinsing water about 5.5 percent wet solids and 2.2 percent oil, expressed as percentages of the amount of herring received for filleting, excluding overweight which may be about 5 percent.

Plant specifications: The manufacturer supplies plants in the following capacities:

Size	Rinsing Water from Raw Herring	Equal to U. S. Gallons Per Hour
I	12 metric tons (26,400 lbs.) raw herring per hour	6,600
II	6 metric tons (13,200 lbs.) raw herring per hour	3,435
III	1.8 metric tons (3,960 lbs.) raw herring per hour	1,055

The manufacturer states that the Size I plant, operating on rinsing water from filleted herring with 16.5 percent oil, would produce:

650 kilos (1,430 lbs.) per hour of wet solids worth 1.05 cents per lb.
260 kilos (570 lbs.) per hour of purified oil worth 8.9 cents per lb. for a gross profit of about \$65 an hour.

All sizes of plants are automated to the point where they may be operated with one man. Cost, power consumption, and space requirements are:

Size	Cost	Power Required ^{1/}	Space Required ^{2/}
I	\$72,500	60 kw.	32' 2" x 22' 11"
II	\$43,500	35 kw.	22' 11" x 18' 1"
III	\$29,000	20 kw.	19' 8" x 16' 5"

^{1/}Power consumption is lower during operation.

^{2/}Ceiling height required is 10' 8". Plant can be installed in smaller space and with lower ceiling, if necessary. Measurements assume collecting tank for rinsing water and purified oil storage tank are outside room.

The first plant was conceived by a large and progressive processor and exporter of Danish fishery products, and the process and plant were developed and installed by a Copenhagen engineering firm. Additional plants are on order by several fishery firms in Denmark and West Germany. Outside of Denmark, the Faroe Islands, and Iceland, the plants will be sold and serviced by an internationally known worldwide distributing organization. The distributing firm's United States representative is located in Poughkeepsie, N. Y. However, the plant and process are so new that it is doubtful that the United States affiliate has much, if any, knowledge of it. Additional technical information may be available from the Copenhagen firm which has issued an illustrated leaflet briefly describing the process in English.

In view of the highly competitive nature of the filleting industry in Denmark, it is expected that all filleting plants of appreciable size which fillet oily fish will have to install purification plants. Production and sale of the formerly wasted oil and solids will be as necessary and profitable an adjunct to filleting operations as the sale of frozen fillet waste to mink farms.

Pressure to install such plants also may come from municipal sources as a means of preventing harbor pollution. Skagen, which is Denmark's second largest fishing port, already is requiring fish plants to clean up their waste water.

The ability to centrifuge rinsing or waste water without heating it makes it possible to install a sludge separator on fishing vessels to process the drainage from the catch and recover an oil and water mixture (mostly oil) for further purifying ashore. This is expected to be profitable for all vessels carry-

ing oily fish for either food or industrial use. Installations in plants that salt herring and canneries also are being contemplated.

In the United States it would appear that the composition of rinsing or waste water in filleting (ocean perch) plants, canneries (which pack sardines, mackerel, salmon, and tuna) and the drainage water in fishing craft might be checked. If the content of oil and solids is high enough, a profit might be made while at the same time a source of pollution is being eliminated. (United States Regional Fisheries Attache for Europe, Copenhagen, December 9, 1964.)

Note: (1) One Danish krone equals US\$0.145 and one kilo equals 2.2046 lbs.
(2) See Commercial Fisheries Review, August 1964 p. 61.



Faroe Islands

FISHERIES TRENDS, NOVEMBER 1964:

Faroeese-West German Landings Agreement: On November 18, 1964, representatives of the Faroeese Government signed an agreement with West German authorities which permits direct landings of fresh white fish in German ports by Faroeese vessels. The term "white fish" includes cod, haddock, coalfish (pollock), plaice, and halibut, but not ocean perch or herring. The agreement became effective December 1, 1964, but can be terminated on April 30, 1965. Unless terminated, it continues automatically for additional one-year periods. Under the agreement, the Faroe Islands are given the same rights as Iceland with regard to direct landings on West Germany. The mutual prohibition against direct landings by Danish vessels in West Germany or by German vessels in Denmark is not affected.

The Faroeese expect that the new agreement will aid them in marketing fresh fish formerly delivered to Great Britain. Limits have been placed on Faroeese direct landings in Great Britain which may divert sizable Faroeese landings elsewhere, particularly in the October and January quarters. It has been estimated that as much as 6,000 to 8,000 metric tons of Faroeese fresh fish might be landed in West German ports during the October and January quarters. A Faroeese representative in Hamburg will inform the Faroeese fishermen of market conditions in Germany so that the Faroeese landings may be regulated to obtain the best possible prices.

Rumanian Factory Trawlers off Faroe Islands: A State-operated Rumanian fisheries company has sent 2 new 4,000-ton factory trawlers to fish the waters between the Faroe Islands and Iceland, according to a November 24, 1964, report in a Danish newspaper. One of those vessels, the "Constanta," stopped in Thorshavn for minor repairs. The vessel is a stern-trawler with a crew of 81. It is equipped with the most modern technical fishing and navigating equipment and also serves as a mothership for two 50-ton motor cutters. The two factory trawlers were built in Japan and carried Japanese technicians on their first voyage.

United States Charter of Faroeese Vessel for Tuna Fishing in Somali Not Completed: Plans for a United States charter of a Faroeese fishing vessel for use in Somali were cancelled at the last moment because a concession from the Somali Government to the United States firm was changed from 15 to 8 years. The Faroeese freezer vessel *Skugvur* was to have been chartered by a Massachusetts cold-storage firm for 4 to 6 months to operate in the tuna fisheries off Somali. It was to fish for tuna and also accept the catches of other vessels until a freezing plant had been completed in the Gulf of Aden by the United States firm. Its crew was to teach Somali fishermen fishing and catch handling methods. Since the charter plans were cancelled, the *Skugvur* will take a cargo of frozen cod blocks to Gloucester, Mass., after which the vessel may long line for tuna in the Caribbean area.

Norwegians Desire Landing Rights in the Faroe Islands: Norwegian fishermen are reported to be dissatisfied because they have no landing rights in the Faroe Islands while Faroeese fishermen may land fish in Norway. Norwegian fishermen would like permission to freeze bait and process fish in

Faroe Islands (Contd.):

Faroe waters, especially when forced to seek shelter during stormy weather. In addition, they would like to land and sell the fish which they can not process on the trip back to Norway. The Norwegians say they often have had to throw fish overboard. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, December 2, 1964.)



French Somaliland

TUNA EXPLORATIONS IN THE GULF OF ADEN:

In late 1964, the French tuna vessel Tutina was exploring tuna prospects in the Gulf of Aden with a view toward establishing a tuna fishing installation in French Somaliland at the port of Djibouti. For the same reason, the exploratory fishing vessel Tadjourah has been investigating tuna fishing possibilities since July 1964 in the Gulf of Tadjourah off French Somaliland. (United States Embassy, Addis Ababa, December 19, 1964.)



Ghana

JAPANESE COMPLETE SECOND STERN TRAWLER FOR GHANA:

The second of 10 large stern trawlers ordered by the Ghana Fisheries Corporation was completed in early December 1964 by a Japanese shipbuilding firm in Osaka. The vessel was scheduled for delivery to her owners on December 17, 1964. The vessel (1,850 gross tons) will be manned by 25 Japanese nationals in accordance with a technical services agreement concluded between Japan and Ghana. (Suisan Tsushin, December 11, 1964.)



Greece

OFFSHORE FISHING FLEET, 1963:

The Greek fleet of trawlers and purse-seiners operating in offshore waters of the Atlantic and Mediterranean as of December 31, 1963, included 23 Atlantic freezer-trawlers with a total tonnage of 14,558 tons; 364 other trawlers with a total tonnage of 15,383 tons; 293 purse-seiners with a total tonnage of 4,652 tons; and 139 mixed vessels (serving as trawlers and seiners) with a total tonnage

of 2,849 tons. Total tonnage of the 819 vessels in the offshore fishing fleet amounted to 37,442 tons. (Alieia, September 1964.)



Haiti

CONSTRUCTION OF NEW FISH PROCESSING PLANT COMPLETED:

The construction of a fish freezing and packing plant in Haiti by a United States firm was completed this past summer. Dedication ceremonies held on August 27, 1964, were attended by United States and Haitian officials. The plant, which is designed for freezing and exporting fish and shellfish products, is reported to be completely equipped but as of the end of November had not started operating. The exact location of the plant was not given but is believed to be in Port-au-Prince. (United States Embassy, Port-au-Prince, November 27, 1964.)



Iceland

EXPORTS OF FISHERY PRODUCTS, JANUARY-SEPTEMBER 1964:

During January-September 1964, there was an increase in exports of salted fish (uncured), frozen fish fillets, cod-liver oil, fish

Product	Jan.-Sept. 1964			Jan.-Sept. 1963		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
	Metric Tons	1,000 Kr.	US\$ 1,000	Metric Tons	1,000 Kr.	US\$ 1,000
Salted fish, dried	728	18,425	427	1,579	32,065	744
Salted fish, uncured	22,756	352,316	8,174	17,569	221,266	5,133
Salted fish fillets	1,014	14,656	340	969	12,291	285
Wings, salted	1,173	14,765	343	1,504	18,484	429
Stockfish	7,317	203,796	4,728	5,202	146,323	3,395
Herring on ice	19	140	3	7,224	23,417	543
Other fish on ice	23,835	139,415	3,234	22,960	121,199	2,812
Herring, frozen	15,098	90,264	2,094	26,159	144,498	3,352
Other frozen fish, whole	2,654	26,817	622	2,265	24,133	560
Frozen fish fillets	44,359	888,421	20,611	41,535	767,720	17,811
Shrimp and lobster, frozen	960	87,477	2,029	438	44,495	1,032
Roes, frozen	1,389	23,775	552	788	13,227	307
Canned fish	204	11,203	260	174	9,036	210
Cod-liver oil	8,714	80,331	1,864	7,175	52,337	1,214
Lumpfish roes, salted	419	10,606	246	324	5,322	123
Other roes for food, salted	2,644	39,515	917	3,176	44,919	1,042
Roes for bait, salted	2,422	20,161	468	1,745	12,571	292
Herring, salted	24,530	264,743	6,142	29,098	295,780	6,862
Herring oil	29,605	231,194	5,364	29,981	139,055	3,226
Ocean perch oil	28	188	4	75	5,130	119
Whale oil	2,812	23,944	556	3,298	23,093	536
Fish meal	25,135	156,172	3,623	11,535	64,317	1,482
Herring meal	65,037	386,693	8,971	44,608	266,186	6,176
Ocean perch meal	1,599	9,354	217	2,953	13,754	319
Wastes of fish, frozen	5,038	15,732	365	4,452	12,426	288
Liver meal	457	3,023	70	371	2,563	59
Lobster and shrimp meal	129	475	11	72	193	4
Whale meal	1,211	6,694	155	100	558	13
Whale meat, frozen	1,809	14,395	334	1,967	13,564	315

Notes: Values converted at rate of 1 krona equal 2.32 U. S. cents.

Iceland (Contd.):

meal, and herring meal as compared with the same period in 1963, according to the Icelandic periodical Statistical Bulletin, November 1964. Exports of herring on ice, frozen herring, salted herring, and ocean perch meal showed a considerable decrease in the first 9 months of 1964.

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FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-JULY 1964:

Species	January-July	
	1964	1963
	... (Metric Tons) ...	
Cod	253,919	203,157
Haddock	30,431	30,007
Saithe	16,488	8,270
Ling	3,335	4,149
Wolffish (catfish)	7,387	11,921
Cusk	2,766	4,826
Ocean perch	16,227	19,648
Halibut	644	695
Herring	289,033	196,026
Shrimp	202	349
Capelin	8,640	1,077
Lobster	2,156	3,068
Other	5,301	4,469
Total	636,529	487,662

Note: Except for herring which are landed round, all fish are drawn weight.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-JULY 1964:

How Utilized	January-July	
	1964	1963
	... (Metric Tons) ...	
Herring ^{1/} for:		
Oil and meal	263,707	126,696
Freezing	12,573	20,605
Salting	21,300	43,982
Fresh on ice	-	5,617
Groundfish ^{2/} for:		
Fresh on ice	21,019	19,139
Freezing and filleting	141,618	125,304
Salting	82,984	65,793
Stockfish (dried unsalted)	79,915	65,971
Canning	117	237
Oil and meal	2,547	2,290
Crustacea for:		
On ice	-	2
Freezing	2,322	3,334
Canning	36	82
Home consumption	8,391	8,610
Total production	636,529	487,662

^{1/}Whole fish.
^{2/}Drawn fish.



Indonesia

JAPANESE-INDONESIAN SHRIMP FISHING VENTURE:

An Indonesian company in Djakarta has signed an agreement with the Wakayama Prefecture Fishing Company of Japan for a fishing venture off Indonesia, according to the Indonesian periodical Antara. Under the agreement the Japanese firm will provide a first installment of credit amounting to US\$1.5 million to purchase vessels and equipment. The equipment is scheduled to start arriving in Indonesia in January 1965 and production is to be under way by mid-1965. After production gets started, 20 metric tons of shrimp a month are to be exported to Japan to repay the loan. (United States Embassy, Djakarta, November 27, 1964.)



Japan

EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO UNITED STATES, JANUARY-OCTOBER 1964:

Japan's export validations of frozen tuna and cooked frozen tuna loins to the United States in October 1964 totaled 7,728 short tons, of which 57.2 percent was albacore, 35.3 percent yellowfin tuna, 0.1 percent big-eyed tuna, 0.8 percent skipjack and 6.6 percent tuna loins.

During January-October 1964, export approvals amounted to 96,757 short tons, an increase of 31,270 short tons (47.7 percent) from the 65,487 short tons exported during the comparable period in 1963. On a species basis, albacore exports were up 62.6 percent, yellowfin 40.5 percent, skipjack 22.6 percent, tuna loins were up 17.2 percent. Big-eyed exports were down 3.2 percent. One short ton of bluefin tuna was exported compared with 374 short tons shipped during the comparable period in 1963.

In January-October 1964, direct shipments accounted for 57.4 percent of the total tuna exports to the United States and transshipments accounted for 42.6 percent. In the comparable period of 1963, total exports were about equally divided between direct shipments and transshipments.

Frozen tuna approved for export during the period January-October 1964 exceeds the

Japan (Contd.):

Japan's Export Validations of Frozen Tuna and Tuna Loins to U. S., Oct. 1964 and Jan.-Oct. 1963-1964										
Species	October 1964			January-October 1964			January-October 1963			Total 1963
	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	
Albacore, round	1,945	2,473	4,418	23,004	28,621	51,625	10,490	21,268	31,758	36,737
(Short Tons)										
Yellowfin:										
Round	-	317	317	-	1,405	1,405	-	781	781	-
Gilled and gutted:										
20/100 lbs.	1,638	282	1,920	24,204	3,541	27,745	15,750	3,853	19,603	-
100 lbs. up	111	-	111	2,347	-	2,347	890	-	890	-
Dressed with tail	3	380	383	78	4,351	4,429	-	3,926	3,926	-
Fillets	-	-	-	33	12	45	294	104	398	-
Total yellowfin	1,752	979	2,731	26,662	9,309	35,971	16,934	8,664	25,598	33,370
Big-eyed:										
Gilled and gutted	-	5	5	30	35	65	24	4	28	-
Dressed with tail	-	4	4	-	201	201	-	240	240	-
Fillets	-	-	-	37	3	40	6	42	48	-
Total big-eyed	-	9	9	67	239	306	30	286	316	316
Bluefin, fillets	-	-	-	-	1	1	-	374	374	374
Skipjack, round	-	60	60	8	3,029	3,037	70	2,407	2,477	3,762
Loins:										
Albacore	310	-	310	2,746	-	2,746	2,130	-	2,130	-
Yellowfin	200	-	200	3,071	-	3,071	2,677	-	2,677	-
Bluefin	-	-	-	-	-	-	157	-	157	-
Total loins	510	-	510	5,817	-	5,817	4,964	-	4,964	6,183
Grand Total	4,207	3,521	7,728	55,558	41,199	96,757	32,488	32,999	65,487	80,742
Source: Japan Frozen Food Exporters Association.										

Source: Japan Frozen Food Exporters Association.

total amount of tuna exported during the entire year in 1963 by 16,015 short tons. (Fisheries Attache, United States Embassy, Tokyo, December 1, 1964.)

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APPROVED EXPORTS OF FRESH AND FROZEN TUNA:

The quantity of fresh and frozen tuna approved for export for the 7-month period

Japanese Exports of Fresh and Frozen Tuna, April-October 1964			
Item	Exports to:		
	U. S.	Overseas Bases ^{1/}	Other ^{2/}
	... (Short Tons) ...		Metric Tons
Albacore (round) ...	38,876	4,272	4,214
Skipjack (round) ...	26,305	1,484	13,759
Yellowfin ^{3/} ...	303	564	5,848
Big-eyed ^{3/} ...	1,991	19	101
Bluefin ^{3/} ...	-	-	7,811
Loin ^{4/} ...	4,449	-	-
Total April-Oct 1964	71,924	6,339	31,733
April-Oct. 1963 ..	39,229	11,474	35,885

^{1/}Primarily to American Samoa and Penang, Malaysia.^{2/}Europe, Africa, and Australia.^{3/}Actual weight of gilled-and-gutted, dressed (with tail), and filleted tuna.^{4/}Includes mixture of different tuna species.

April-October 1964 totaled about 102,000 metric tons, according to data compiled by the Japan Frozen Foods Exporters Association. The 1964 exports approved by the Association exceed comparable 1963 exports by some 25 per cent. (Suisan Tsushin, November 26, 1964.)

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PRICES DROP FOR ATLANTIC FROZEN ALBACORE TUNA IN DECEMBER 1964:

The sharp price drop in December 1964 for frozen Japanese albacore tuna on the United States market, brought about by unusually good Japanese fishing in the tropical Atlantic Ocean and by lack of buying interest among U. S. packers, created an excess supply of 3,000-4,000 tons of Japanese frozen Atlantic albacore. According to reports in December 1964, one major U. S. tuna packing firm had not bought any Japanese tuna since the fall of 1964.

Reportedly, some frozen Atlantic albacore tuna sold in early December 1964 for as low as US\$325 a short ton, c. & f. Puerto Rico.

Japan (Contd.):

The ex-vessel price for albacore tuna in Japan in December 1964 was 115 yen a kilogram (\$290 a short ton). (Suisan Tsushin, December 4, 1964, and other sources.)

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COST OF SHIPPING INDIAN OCEAN FROZEN TUNA TO PUERTO RICO:

The cost of shipping to Puerto Rico Japanese-caught Indian Ocean frozen tuna from the transshipment ports of Port Louis, Mauritius Island, and Durban, South Africa, was estimated to be US\$70-80 a short ton in November 1964. Japan is mainly transshipping frozen albacore to the United States canneries in Puerto Rico at \$355-360 a short ton c.i.f., or at the same price as that for albacore of Atlantic origin. To reduce shipping costs, the Japanese firms operating the two tuna bases are jointly using the same carrier vessels. (Suisan Tsushin, November 13, 1964.)

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NEW TUNA PURSE-SEINE OPERATION OFF AFRICA OBSERVED BY FISHING COMPANY OFFICIALS:

Two officials of a leading Japanese fishing company arrived in West Africa early in December 1964 to study their company's new purse-seine operation. They were scheduled to spend about 2 weeks at sea observing the 2-vessel seining of the Kuroshio Maru Nos. 81 and 82. Plans called for those vessels to work together in setting a purse-seine net 2,000 meters (6,560 feet) long and 200 meters (656 feet) deep. The Japanese believe the use of two vessels to set the net on a school of tuna will speed the surrounding operation. The two vessels also jointly purse the net. The two Japanese seiners are supported by the mothership Chichibu Maru No. 2. Yellowfin and skipjack tuna are the objectives of the purse-seine fleet off Africa.

(Editor's Note: Japanese newspaper reports have indicated that the Kuroshio Maru Nos. 81 and 82 are equipped with a newly patented net hauler. Called the "side hauler," this gear consists of a number of rubber "balls" mounted at 2-meter intervals on a hydraulically-operated rotating shaft located on the side of the vessel. During net hauling, the "balls" on the rotating shaft cause the net to fold between them, thus facilitating hauling.

The "side hauler" is reported to greatly reduce the manpower needed for net handling.)

If the two-vessel purse-seine operation proves successful off West Africa, it may result in major changes in the fishing gear and methods used by one of Japan's leading fishing companies.

While in Africa, the Japanese company officials observed tuna shipping activities in Freetown, Sierra Leone; Monrovia, Liberia; and Accra, Ghana.

Another purpose of the Japanese officials' visit to Africa was to work out plans for a live-bait supply operation that could save the tuna live-bait fleet valuable time. Plans were reported for a local bait fishery to supply shore-based storage facilities with a continuous supply of live bait. If successful, such a service is expected to save tuna vessels fishing with bait about 36 hours each trip. (Fisheries Attache, United States Embassy, Abidjan, December 8, 1964.)

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TUNA PURSE-SEINE FLEET REPORTS POOR FISHING OFF WEST AFRICA:

The Japanese Chichibu Maru No. 2 (1,639 gross tons) purse-seine fleet, accompanied by the new seiners Kuroshio Maru Nos. 81 & 82 (each of 145 gross tons) as of early December 1964 reported poor fishing. As of early December, landings totaled 200 metric tons, mainly skipjack tuna. The fleet commenced fishing November 17. (Shin Suisan Shimbun Sokuho, December 9, 1964.)

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FLEET FISHING TUNA IN GULF OF GUINEA:

A Japanese fishing company's five-vessel purse-seine fleet (led by the 1,600-ton mothership Chichibu Maru No. 2) commenced fishing in the Gulf of Guinea on November 7, 1964. On the first day the fleet caught about 7 metric tons of tuna; on the second day 25 tons (mainly skipjack). Subsequently, the fleet caught 3-4 tons a day.

The Chichibu Maru fleet (scheduled to operate in the Atlantic Ocean for two years) is experimenting with a mechanical net hauler called the "side hauler." High expectations are held for that device. (Suisan Tsushin, November 26, 1964.)

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Japan (Contd.):

TUNA MOTHERSHIP FLEET FROM SOUTH PACIFIC LANDS:

A large Japanese fishing company's tuna mothership fleet, led by the mothership Shinyo Maru (3,800 gross tons), landed in Japan with 1,244 metric tons of tuna, spearfish, and shark, on November 18, 1964. The tuna catch was 206 tons of yellowfin, 506 tons of albacore, and 102 tons of other tuna species. The catcher vessels averaged 1.9 tons of fish a day. The fleet was last reported operating the Fiji Island waters at latitude 18° 43' S. and longitude 172° 54' E. (Suisancho Nippo, November 21, 1964.)

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TUNA MOTHERSHIP OPERATIONS IN SOUTH PACIFIC SHOW LOSSES:

The large Japanese fishing company which operated the Yuyo Maru (5,500 gross tons) tuna mothership fleet in the South Pacific off the Fiji Islands in the summer of 1964 reported a loss of about 8 million yen (US\$22,222) for that operation. The loss was attributed to the failure of some of the accompanying large catcher vessels (180-220 gross tons) to deliver all their catches to the mothership, with the result that the fleet catch target could not be met. In view of the loss, the Japanese firm (which in December 1964 was conducting winter operations with the tuna mothership Shinyo Maru, 3,800 gross tons) may reduce its mothership operations to 1 fleet in 1965. In 1963 that firm was reported to have lost 150 million yen (\$416,667) in its tuna mothership operation.

Another large Japanese firm which also operated a tuna mothership (Nojima Maru, 8,800 gross tons) fleet in the South Pacific in the summer of 1964, is reported to have lost 150 million yen (\$416,667) in 1964 and 70 million yen (\$194,444) in 1963. Reportedly, that firm may not conduct mothership-type operations in the South Pacific in 1965. (Suisancho Nippo, December 11, 1964.)

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TUNA FISHING TRENDS IN ATLANTIC OCEAN:

The Japanese tuna long-line fleet in the Atlantic Ocean as of early December 1964 continued to catch large quantities of albacore tuna. This resulted in driving down albacore export prices. Reportedly, some al-

bacore sold for as low as US\$325 a short ton c.&f. Puerto Rico (the check-price level). Informed sources claim that the excessive competition between Japanese exporting firms has not helped the situation, and has contributed to the price decline.

The ex-vessel price for albacore in Japan was about 115 yen a kilogram (US\$290 a short ton). (Suisan Tsushin, December 2 & 4, 1964.)

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TUNA RESOURCES IN ATLANTIC TO BE SURVEYED:

The 500-ton guidance vessel Iwaki Maru of the Fukushima Prefectural Fisheries Research Laboratory was to have departed Onahama on December 5, 1964, for the Atlantic Ocean. The Iwaki Maru, at the request of the Food and Agriculture Organization (FAO), is cooperating in the Atlantic tropical tuna survey and will remain at sea for 18 months. Tuna caught by that vessel will be handled for sale by a Japanese trading firm. (Suisancho Nippo, December 3, 1964.)

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TUNA FLEET IN TROPICAL ATLANTIC:

About 140 Japanese tuna vessels were reported to be operating in the tropical Atlantic Ocean, as of early December 1964. The combined carrying capacity of the 140 vessels totaled about 48,000 tons.

The carrying capacity of the 82 vessels operated by the 5 large Japanese fishing companies and their affiliated firms totaled over 35,000 tons or over 70 percent of the combined capacity of the entire Japanese tuna fleet in the tropical Atlantic. (Suisan Tsushin, December 12, 1964.)

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POOR SAURY SEASON CREATES TUNA BAIT SHORTAGE:

The 1964 saury fishing season in Japan as of early December 1964 was extremely poor and the light landings forced ex-vessel prices up to a high of over 100 yen a kilogram (US\$252 a short ton) at Choshi, Chiba Prefecture (east of Tokyo), and to 60-80 yen a kilogram (\$151-202 a short ton) in the Sanriku region (northeastern Japan).

Saury are used extensively as bait in the tuna long-line fisheries and the poor saury

Japan (Contd.):

season threatens to create a severe shortage for bait in 1965. Yearly consumption of saury as tuna bait totals an estimated 40,000-60,000 metric tons, but the saury bait supply, as of early December, was estimated at only 25,000 metric tons, thus leaving a forecasted shortage, as of early December, of at least 15,000 tons.

The Japanese pack of canned saury, as measured by consignments made to the Canned Saury Sales Company as of December 8, 1964, was reported at 500,400 actual cases. Owing to poor fishing conditions, difficulty of procuring supply, and the high prices for the raw product, the saury packers were expected to end packing operations for the 1964 season early in December. (Suisan Tsushin and Suisancho Nippo, December 10, 1964.)

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REFUELING OF TUNA VESSELS AT SEA:

The 1,983-ton tanker Tofuku Maru, chartered by the Japan National Federation of Tuna Fishermen's Associations to refuel the Federation's tuna vessels operating in the eastern Pacific, was scheduled to return to Yokohama in late November 1964 after a 195-day trip. The tanker refueled at sea a total of 119 vessels and contributed substantially to the improvement of their operations and earnings since those vessels, as a result of not having to run into port to refuel, were able to spend that many more days fishing. (Minato Shimbun, November 19, 1964.)

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TUNA VESSEL DESIGN
IMPROVEMENT STUDIES:

To reduce manpower requirements in the tuna fishery, the Japanese Fisheries Agency may start a vessel design study. The Agency is reviewing a plan to construct and test a model tuna vessel for operation in the distant-water tuna fishery, where the need for vessel improvement is most critical. Construction of the model vessel is expected to be undertaken sometime after 1966. In the meanwhile, the Agency hopes to establish a research group, to be formed by Government and industry scientists, fishing experts, and shipbuilding and equipment engineers, to study and develop recommendations. (Suisan Tsushin, December 14, 1964.)

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EXPORTS OF CANNED TUNA TO
UNITED STATES SUSPENDED:

The Japanese Ministry of International Trade and Industry (MITI) on December 1, 1964, suspended all canned tuna exports to the United States. The reason is that despite the expiration on November 20, 1964, of the agreement for business year 1964 (concluded among the export traders concerned on the basis of the Export-Import Transactions Law), a new agreement for business year 1965 (begins December 1) has not been concluded among those traders because of the conflict between the traders and cannerys. Attaching importance to this situation, MITI and the Japanese Fisheries Agency are making efforts to mediate between the two groups.

At present, 18 trading companies are exporting canned tuna to the United States at a fixed quota allotted under the agreement concluded among those companies. The cannerys involved, however, have strongly asked for a revision of the agreement since the spring of 1964. But the trading circles concerned tried to maintain the existing agreement by rejecting the cannerys' request. The assertions of the two groups have followed parallel lines and the agreement has finally expired. The result is that no agreement was concluded since December 1, 1964. MITI, therefore, has adopted measures not to approve exports until conclusion of a new agreement because of apprehension that it might adversely affect the pattern of exports. Some quarters fear that if this situation continues it may seriously affect exports for the new business year.

The cannerys are strongly opposed to the agreement concluded among the trading companies because the amount of exports for 1964 was 2,204,000 cases (48 No.2 or 7-oz. cans/cs.) which was below the level of 2,270,000 cases for 1963 and the level of 2,300,000 cases for the year before that. The cannerys also believe that under the selling methods based on the agreement there is a gap between the quota and the trading companies' selling capacity and that this is the greatest cause for the deterioration of the export pattern.

The trading circles concerned, however, attribute the export decline for 1964 to the fact that in 1963 stocks were carried over to 1964 due to the canned tuna botulism incident in 1963 and that production in the United States has increased. Those circles emphasize that it is not true that the responsibility for the situation lies in the agreement, as the cannerys concerned say it does. Under such circumstances, MITI and the Fisheries Agency are strongly asking the two sides to settle the problem through immediate negotiations. MITI also plans not to approve exports until a new agreement is concluded. (Nihon Kogyo, December 3, 1964.)

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PACKERS AND EXPORTERS FAIL
TO MAKE CANNED TUNA
EXPORT AGREEMENT:

As a result of the failure of Japanese tuna packers and exporters to settle a new export agreement covering the export of canned tuna to the United States for the business year December 1964-November 1965, the Japanese Ministry of International Trade and Industry (MITI) provisionally extended the old agreement which expired November 31, 1964. Some members of the Japan Packers Association (formerly shared the minority view but have managed to gain adherents to their views to a point where they have a powerful voice in the Association) feel that the old export agree-

Japan (Contd.):

ment should be completely revised so as to cope with declining canned tuna exports to the United States.

At the request of the Fisheries Agency, the Packers Association was to hold an executive meeting on December 9, 1964, to consolidate the views of the group. The views held by the Association and those held by the exporters are said to be irreconcilable. It is reported that in the end the Fisheries Agency (which is said to lean toward the packers' viewpoint) and MITI (which shares the views of the exporters) may have to get together in an attempt to reach settlement on a new agreement. (Suisan Tsushin, December 5, 1964, and other sources.)

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FUNDS BUDGETED FOR CANNED TUNA PROMOTION IN UNITED STATES:

The International Tunafish Association of Japan has budgeted 48,501,000 yen (US\$134,725) for promoting the sale of canned tuna in the United States. Half of that sum is to be subsidized by the Japanese Government.

The sum of 24,250,680 yen (\$67,363) is to be used for public relations aimed at promoting the demand for canned tuna in the United States through a national program directed at the American family. In addition, efforts will also be directed toward increasing use of tuna in the hotel and restaurant trade and at government facilities. This phase of the program is directed by a United States public relations firm to promote tuna packed by United States packers who are the

customers of the Japanese export frozen tuna industry.

The sum of 23,250,320 yen (\$67,362) is to be spent on 10- and 20-second television spots promoting Japanese canned tuna in brine. The spots are to be televised in the New England and New York areas for two months (February 1-March 30, 1965). That part of the promotion is being handled by a New England advertising agency. (Suisan Tsushin, December 3, 1964, and other sources.)

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CANNED TUNA MARKET SURVEY CONDUCTED IN U. S. CITIES:

A canned tuna market survey of the Boston (Mass.) and New York areas made by the Japan External Trade Organization (JETRO) reveals that October 1964 sales of brand-name Japanese products were steady but those of lesser known brands were poor. Except for one case where solid white tuna in brine (7 oz. 48's) sold at a promotional discount of US\$0.20 a case, all Japanese brands were being sold at list price. Sales in October were reported at the same level as in September. (Suisan Tsushin, December 2, 1964.)

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KING CRAB TRAP FISHING PLANNED IN BRISTOL BAY:

The Japanese Fisheries Agency has decided to license trap fishing for king crab in 1965 in the waters set aside specifically for trap fishing in Bristol Bay. That decision follows the United States-Japan king crab fishery agreement to establish an area off Alaska especially for crab fishing by traps and to



Japanese king crab factoryship Tokei Maru.

Japan (Contd.):

prohibit the use of any other crab fishing method in that specific area.

The 9 Japanese fishing companies which jointly operate the Dainichi Maru (5,858 gross tons) and Tokei Maru (5,385 gross tons) king crab factoryship fleets in Bristol Bay are reported to have agreed to a Fisheries Agency recommendation that they employ crab-pot gear in 1965. Each of the 2 fleets are expected to employ 1 crab-pot fishing vessel in 1965. (Shin Suisan Shimbun Sokuho, December 11, 1964; Nihon Kogyo, December 14, 1964.)

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POTS MAY BE USED TO FISH KING CRAB IN BRISTOL BAY IN 1965:

The Japanese fishing companies which operate the king crab factoryships Tokei Maru (5,385 gross tons) and the Dainichi Maru (5,858 gross tons) are planning to fish with crab pots in Bristol Bay in 1965. Reportedly, the use of crab pots will add to their operational cost, but they are expected to follow the recommendation of the Fisheries Agency to experiment with pot fishing in Bristol Bay. Although plans have not been completed, each of the two fleets is expected to operate one crab-pot fishing vessel in 1965. (Shin Suisan Shimbun Sokuho, December 4, 1964.)

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JAPANESE FEEL SOVIETS MAY START MOTHERSHIP-TYPE SALMON FISHERY IN NORTH PACIFIC:

According to unofficial Japanese sources, some elements within the Soviet fisheries structure are hopeful of developing a high seas salmon fishery in the North Pacific off the Soviet coast. In June 1964 the Soviet Union was reported as having conducted experimental high-seas salmon operations, employing a mothership. Details concerning that vessel's operations have not been divulged. The Japanese fishery delegation which visited the Soviet Union this year (1964) is said to have explored this matter but received no response from the Soviet Union. However, Japanese sources believe the operation was not very successful.

According to those sources, the Soviet Union attributes the decline in Asian salmon runs to the effect of the Japanese high-seas fishery. As a result of declining runs, the Soviet

Union reportedly has had to gradually reduce the scope of her shore-based fishing operations, even to the extent of causing the closure of some facilities, and some Russian circles are now said to be strongly pushing for the development of a high-seas salmon fishery. Reportedly, many within the Soviet Government fisheries structure oppose such a plan. However, the Soviet Union has the technical knowledge and fishing vessels to enable her to conduct a high-seas fishery for salmon, if she so wishes.

The Japanese sources believe that the Soviet Union will likely not undertake to develop immediately a high-seas salmon fishery like that of Japan, but may begin by conducting mothership-type operations off the Soviet coast between Olyutorski and Cape Anadyr to exploit the chum and pink salmon resources of those regions. (Suisan Keizai Shimbun, November 29, 1964.)

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LICENSING OF VESSELS FOR NORTHEASTERN PACIFIC TRAWL FISHERY TO BE STUDIED:

The Japanese Fisheries Agency, which was expected to announce in January 1965 vessel licensing regulations for the northeastern Pacific trawl fishery, was requested to study the situation carefully before licensing additional trawlers in 1965. The request was made not in complete opposition to an increase in vessels to be licensed in 1965. The reasons for that point of view were: (1) an increase in vessels over the 1964 fleet of 6 trawlers would further disrupt the market for rockfish (main species taken in that fishery), the prices for which declined drastically in 1964; (2) high-priced fish, such as sablefish, are not abundant and shrimp can only be fished in confined areas; and (3) good trawling grounds are limited and spotty. It is believed vessels licensed for that fishery would find it difficult to operate on a profitable basis, as indicated during the 1964 season which was barely satisfactory. Therefore, if the Agency should plan on licensing additional trawlers for operation in the northeastern Pacific in 1965, then the increase should not be large.

The Fisheries Agency was studying plans on licensing a total of less than 10 trawlers in the northeastern Pacific in 1965. (Suisan-cho Nippo, December 7, 1964.)

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Japan (Contd.):

TRAWLERS LICENSED FOR
NORTHEASTERN PACIFIC IN 1965:

The Japanese Fisheries Agency is planning on authorizing the operation in the north-eastern Pacific in 1965 of not more than 2 or 3 trawlers in addition to the 6 vessels licensed in 1964. The Agency is also expected to remove the seasonal restriction placed on that fishery and to permit year-round operation. Further, the trawlers engaged in that fishery will be permitted on a gradual basis to fish with 1 or 2 smaller vessels. (Suisan Tsushin, November 30, 1964.)

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BOTTOMFISH MOTHERSHIP ASSOCIATION
SUBMITS RECOMMENDATIONS ON
NORTH PACIFIC-BERING SEA FISHERY:

The Japan Northern Waters Bottomfish Mothership Association, on December 7, 1964, presented the following recommendations to the Japanese Fisheries Agency for the 1965 bottomfish fishery in the Bering Sea and the North Pacific:

1. The Government should not permit an increase in fishing effort in the Bering Sea beyond the 1964 scale of operations. Despite the reduction in mothership-type operations enforced by the Association to stabilize the bottomfish fishery, success has not been achieved due to the entry into the Bering Sea fishery of additional independently operating trawlers withdrawn from other fisheries.

2. The valid period for licenses should be extended from the present one year to two years or more, and the Government should take appropriate action to cope with any changes in fleet composition during the effective period of the licenses.

3. The North Pacific waters south of the Aleutian Islands west of 165° W. longitude should be combined with the eastern Bering Sea as an operational area for the mothership-type bottomfish fishery. Inclusion of the waters south of the Aleutians west of 165° W. longitude, where four trawl fleets fished experimentally in 1964, would permit wider distribution of fishing effort and thus contribute to the conservation of resources of the Bering Sea.

4. Operational order should be firmly established for the northern waters bottomfish

fishery. Independently operating trawlers diverted from other fisheries and licensed to operate in the western and central Bering Sea have, in some instances, extended their operations beyond their licensed area. These violations unfortunately have served to invite the distrust of foreign fishermen.

5. The Gulf of Alaska fishery, presently regulated as an experimental fishery, should be established as a regular licensed fishery in 1965. Fleet operations should be maintained at the 1964 level due to the limited grounds where commercial fishing is possible and since these grounds are being developed.

6. The eastern limit of the operational area for the Gulf of Alaska fishery should be expanded from the present line at 135° W. longitude to the waters off Vancouver. In addition to Japan, the Soviet Union is operating a huge fleet in the Gulf of Alaska. Canada is also reported to be getting ready to fish bottomfish in the Gulf. It would be desirable that the operational areas be expanded to permit Japan to expand her operations into those international waters and to develop a fishery by exploring and using the unexploited resources.

7. The number of trawlers to be authorized for operation in the Gulf of Alaska should be held at the same level as in 1964. However, in licensing additional vessels, preference should be given to firms engaged in the mothership-type bottomfish fishery.

8. Transfer of catch at sea should be permitted. (Suisan Tsushin, December 8, 1964.)

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BERING SEA FISHERY OPERATIONS,
DECEMBER 1964:

The Japanese Chichibu Maru (7,420 gross tons) fleet ended its second half year of shrimp fishery operations in the eastern Bering Sea on December 10, 1964, and was to have returned to Hakodate on December 15. The Chichibu Maru's production totaled about 60,000 cases (48 ¼-lb. cans) of shrimp and 5,500 metric tons of frozen fish (consisting of rockfish 1,600 tons, yellowfin sole 1,200 tons, black cod 800 tons, herring 700 tons, and heads-off shrimp 50 tons). The Chichibu Maru's operation ended with a deficit in 1964 since the mothership was unable to meet her production target, reportedly due to loss of fishing time resulting from bad weather in

Japan (Contd.):

October and November. Additional fishing time was lost when that vessel was diverted to Prince William Sound in late summer to pick up fresh salmon purchased from Alaskan fishermen.

The same firm's trawler Akebono Maru No. 71 (3,500 gross tons) concluded her first phase of operations in the eastern Bering Sea and was scheduled to return to Kurihama, Japan, on December 14, 1964. The Akebono Maru's production totaled 1,888 metric tons of bottomfish (1,600 tons of rockfish, 200 tons of black cod, and 88 tons of miscellaneous species). After unloading her catch, the Akebono Maru was scheduled to depart for the Bering Sea again.

Three other 3,500-ton Japanese trawlers (Akebono Maru No. 72, Aso Maru, and Taiyo Maru No. 82) as of mid-December 1964 were still operating in the eastern Bering Sea and were scheduled to continue operations until January or February 1965. (Suisan Tsushin, December 12, 1964.)

TRAWL OPERATIONS IN NORTHWEST ATLANTIC:

The 3,700-ton Japanese stern trawler Tenyo Maru, which operated in the Northwest Atlantic Ocean on an experimental basis for approximately one year, was scheduled to return to Japan in mid-December 1964. The fishing company which operates that trawler is undertaking a study to determine whether or not to send a vessel to the Northwest Atlantic in 1965.

The Tenyo Maru landed 15,000 metric tons of fish (mainly cod), or 62 percent of her production target. Reasons ascribed to the poor catch were: (1) rough seas and the unsuitability of the vessel for operation in the North Atlantic; (2) severe competition on the fishing grounds; (3) poor cod season in general. (Suisan Keizai Shimbun, November 14, 1964.)

NEW STERN TRAWLER SCHEDULED TO FISH IN ATLANTIC OCEAN:

The 3,500-ton Japanese stern trawler Kirishima Maru was delivered to her new owners on November 30, 1964. The trawler was built at a shipyard in Okayama Prefec-

ture and will be dispatched to the Atlantic Ocean following a shakedown cruise. (Suisan-cho Nippo, December 1, 1964.)

LARGE TRAWLER DEPARTS FOR ATLANTIC:

The 1,500-ton Japanese stern trawler Dai-shin Maru No. 15 was scheduled to depart Osaka on November 28 1964, for the trawling grounds off west Africa. The Daishin Maru operated in the Gulf of Alaska in the summer of 1964. (Suisan Tsushin, November 21, 1964.)

CANNED SALMON EXPORTS DOWN IN 1964:

The value of Japan's export of canned salmon in 1964 was expected to drop to the lowest level in the past seven years, mainly due to poor catches, according to the Japan Canned Salmon Sales Company. Exports for 1964 were expected to total about 2,020,000 cases (48 $\frac{1}{2}$ -lb. cans) or about 110,000 cases less than in 1963. Red salmon were expected to account for 850,000 cases (1.1 million cases in 1963); silver 400,000 cases (300,000 cases); pink 600,000 cases (same as 1963); and chum salmon 170,000 cases (130,000 cases). (The Japan Economic Journal, November 10, 1964.)

SALTED SALMON, AND HERRING AND SALMON ROE PRICES:

Herring roe, a traditional New Year's food in Japan, in mid-November 1964 was sold to Japanese wholesalers at prices ranging from 6,000 yen a kilogram (US\$7.57 a lb.) for extra large, 3,800 yen a kilogram (\$4.79 a lb.) for medium, and 2,000 yen a kilogram (\$2.52 a lb.) for small. Prices were for roe of Hokkaido origin. The product was said to be beyond the reach of ordinary consumers and virtually all of it was being purchased by business firms for use as year-end gifts or by high-class restaurants. Domestic roe products being in very short supply in Japan, 120 metric tons of herring roe were imported from the Soviet Union. Of that quantity 70 tons as of mid-November 1964 had been sold and only 40 tons were expected to be available for the year-end trade. The Soviet product (medium and large roe) was selling at 3,000-4,000 yen a kilogram (\$3.79-5.05 a lb.)

Other fishery products which generate tremendous demand in Japan as year-end gifts

Japan (Contd.):

are salmon roe and lightly salted salmon. Japanese domestic salmon roe was selling for 2,000-2,500 yen a kilogram (\$2.52-3.15 a lb.) for high-quality and 1,700-1,800 yen a kilogram (\$2.14-2.27 a lb.) for medium roe. However, much of the salmon roe in supply was imported from the Soviet Union, which was sold at 1,600-1,700 yen a kilogram (\$2.02-2.14 a lb.).

Lightly salted salmon (species not designated but believed to be chum salmon) was quoted at 440-470 yen a kilogram (\$0.56-0.59 a lb.), 10 percent above the price in 1963. (Hokkai Suisan, November 23; Suisan Keizai Shimbun, November 20, 1964.)

DELEGATION NEGOTIATES PURCHASE OF SOVIET HERRING:

A seven-man Japanese delegation was scheduled to leave for Moscow on December 10, 1964, to negotiate the purchase of Soviet herring. The delegation hoped to negotiate a three-year contract calling for the delivery of 4,000 metric tons of (frozen) herring in 1965; 5,000 tons in 1966; and 6,000 tons in 1967. In 1964, Japan contracted for the delivery of 3,000 tons of herring. (Suisancho Nippo, December 3, 1964.)

HERRING ROE PRICES:

Herring roe, a traditional Japanese New Year's food referred to in Japan as the "yellow diamond," reportedly were sold in mid-December 1964 for a new high on the Tokyo wholesale market at the fantastic price of 17,000 yen a kilogram (US\$21.43 a pound) for the top-quality dried product. That price exceeds the 1963 year-end high price of 16,500 yen a kilogram (\$20.80). Lower grade salted herring roe imported from the Soviet Union reportedly are being sold at around 5,000 yen a kilogram (\$6.30 a pound) as compared with 3,500 yen a kilogram (\$4.41 a pound) in 1963. (Suisan Keizai Shimbun, December 11, 1964, and other sources.)

SHRIMP IMPORTS, JANUARY-AUGUST 1964:

Japanese shrimp imports for January-August 1964 totaled 12,299 metric tons on a

customs clearance basis. This was an increase of about 4,500 metric tons, or over 50 percent, above the January-August 1963 imports of 7,737 tons, and also surpasses the overall 1963 imports of 11,533 tons.

Imports from Communist China totaled 4,289 metric tons as compared to total 1963 imports from that country of 2,663 metric tons. Imports of Mexican shrimp (transshipped from U.S.) totaled 3,897 metric tons, or 762 metric tons more than total 1963 imports. (Suisan Tsushin, October 21, 1964.)

KOREAN FISHERY PRODUCTS TO BE IMPORTED:

The Japanese Government announced on December 1, 1964, that it was permitting on a special basis the importation of US\$2 million worth of South Korean fishery products. Products to be imported are squid (\$1 million), yellowtail (\$700,000), and sea bream (\$100,000). Allocation of the remaining sum (\$200,000) is to be determined after examination of domestic market developments. The first shipment of fish was expected to arrive in Japan about mid-December.

The reasons given for the Japanese Government's action are stated to be: (1) strong request made by South Korean Government; (2) shortage of squid, yellowtail, and sea bream in Japan; (3) stabilization of prices for those products in short supply. Political considerations (e.g., improved foreign relations climate, release of Japanese fishing vessels and crews by Korean Government) are said to have played some part in the Government's decision. (Suisan Tsushin, December 2, 1964.)

SHORTAGE IN OKINAWAN LABOR FORCE FOR USE ON JAPANESE FISHING VESSELS:

A survey of the Okinawan labor force conducted in November 1964 by a Japanese official revealed that it may be practically impossible for the Japanese coastal fishery operators to attract young Okinawans to sail on their vessels due to the great shortage of labor in Okinawa. Japanese coastal fishery operators, experiencing great difficulty in attracting young Japanese men into the fishery, had hoped to employ Okinawans and had

Japan (Contd.):

initiated the survey. (Suisan Keizai Shimbun, December 1, 1964.)

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NEW STERN TRAWLER LAUNCHED:

The 3,470-ton Japanese stern trawler Takachiho Maru, owned by a large Japanese fishing company, was launched November 17, 1964, at a shipyard in Okayama Prefecture. The trawler was expected to be completed in January 1965. The vessel's specifications are: length 88 meters (289 feet); beam 16 meters (53 feet); gross tonnage 3,470; dead-weight tonnage 3,400; speed about 15.5 knots; cold-storage holding capacity 3,500 cubic meters (123,585 cu. ft.); main engine 3,900 brake hp.

Press reports indicated that the trawler would be assigned to the Gulf of Alaska in 1965. (Suisancho Nippo, November 11, 1964, and other sources.)

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BOTTOMFISH RESOURCES IN WATERS OFF AUSTRALIA TO BE SURVEYED:

The Japanese Fisheries Agency is proceeding with plans to explore the bottomfish resources in the waters off Australia. The investigation is expected to begin in 1965. The survey is part of the Agency's plan to promote the development of new fishing grounds to counteract the growing trend where Japan is gradually being squeezed out of existing fishing grounds by various coastal states. Reportedly, the high seas off Australia were selected since they hold promise and other foreign countries are not now engaged in fishing those waters. (Suisancho Nippo, November 19, 1964.)

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FISHERY REPRESENTATIVES TOUR COMMUNIST CHINA:

Three Japanese fishery representatives departed Japan on November 21, 1964, on a one-month tour of Communist China at the invitation of the Chinese Fishery Association. Purpose of the tour was to study: (1) Chinese fishery policy, administrative structure, and training and research programs (particularly program changes subsequent to the Second Five-Year Plan); (2) structure of fishery production organizations, living conditions of

fishery workers, and relationship between fishing industry and agriculture; (3) fishing port facilities, distribution, and fish prices; and (4) marine resources conservation programs and Chinese views on international treaties, such as the Conventions on the Law of the Sea and on the Continental Shelf. They were scheduled to visit Hong Kong, Kwangchow, Peking, Shanghai, and Tsingtao.

The Japanese team was Masataka Ide (President, Japan National Fishing Port Association), Shigehisa Matsuda (member of the Japan Marine Products Research Institute), and Makoto Tange (Planning Section, Japanese Fisheries Agency). (Suisan Keizai Shimbun, November 19, 1964.)

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CANNED HAKE MARKETING PROJECT POSTPONED:

The Japanese firm, which had been planning on marketing canned merluza (hake) in Japan beginning in November 1964, was reported to have postponed the sale due to lack of favorable response to the product. Merluza or hake taken in waters off west Africa were packed in oil by the Japanese firm and submitted to a series of taste panels in Japan, as well as exported to Europe on an experimental basis. The product failed to create a favorable reaction reportedly due to the undesirable fish odor present in the pack. (Suisancho Nippo, December 4, 1964.)

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SOVIETS FISHING SAURY OFF NORTHEASTERN JAPAN:

The Soviet fleet fishing for saury off the northeastern coast of Japan was reported in late November 1964 to be operating 20-30 nautical miles off Kinkazan, Miyagi Prefecture. The fleet was said to consist of two 8,000-ton-class motherships and 30 fishing vessels. (Shin Suisan Shimbun Sokuho, November 28, 1964.)

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FIRM BUILDING NEW FREEZER FACTORYSHIP-MOTHERSHIP:

A large Japanese fishing company is constructing a 9,300-gross-ton freezer factoryship-mothership at a shipyard in Yokohama. The mothership, to be called Meisei Maru No. 2, was scheduled to be launched on November 30 1964, and is expected to be opera-

Japan (Contd.):

tional in spring 1965. The Meisei Maru will be used as a salmon mothership during the summer salmon season and for bottomfish fishing in the northern waters (North Pacific, Bering Sea, etc.) during the winter (November through March).

The firm owning the mothership plans to divert the 7,400-ton factoryship Chichibu Maru as a carrier vessel on the Atlantic Ocean run during the winter months. The Chichibu Maru would then replace the Meisei Maru in the spring when the Meisei Maru switches to salmon fishing. (Suisan Tsushin, November 19, 1964.)



Republic of Korea

OFFSHORE FISHING FLEET EXPANDED:

As of November 30, 1964, there were 21 Korean tuna long-line vessels in operation. Those included one 378-ton vessel delivering catches to Port-of-Spain, Trinidad, for a United States firm; two 148-ton vessels delivering to Santos, Brazil, for a British-Japanese firm; and 18 vessels (ranging from 103 to 145 tons) delivering catches to American Samoa for United States firms.

The Korean Government has contributed to the expansion of the Korean fishing fleet by guaranteeing the repayment of certain loans arranged by private Korean firms to finance new fishing vessels. In 1963, the Korean Government approved payment guaranties totaling US\$6.2 million for the following groups of vessels.

- (1) Nine 145-ton tuna vessels financed by United States companies and intended for fishing in the South Pacific. The vessels were delivered by August 1964 from shipyards in Pusan, Korea.
- (2) Ten 135-ton tuna vessels financed by a European company and intended for fishing off western Africa. The vessels were scheduled for delivery in December 1964 by a European company.



A Korean mackerel seiner equipped with a power block for hauling in the seine net.

- (3) Eight 135-ton tuna vessels and two 290-ton tuna vessels financed by a United States firm and intended for Indian Ocean fishing. The vessels, which are being built in Japan, had not been delivered as of November 1964.
- (4) Eleven 140-ton refrigerated vessels financed by a United States company and intended for fishing in the South Pacific. The vessels, which are being built in Japan, had not been delivered as of November 1964.

Late in 1964, the following additional moves to expand Korea's fishing fleet were reported:

(1) On November 20, 1964, the Korean Government approved, subject to approval of the Japanese Government, a payment guaranty for a loan of \$2,735,600 (including \$518,258 in interest) from a Japanese firm. The Korean recipient is a Government-run shipyard in Pusan, Korea. Terms call for 5.5 percent annual interest and repayment of the loan in 7 years after a 6-month deferment. The original purpose of the loan was to build 19 tuna vessels aggregating 2,660 tons. However, if interested parties in Japan concur, the Korean interests now propose to build 2 freighters (one of 4,000 tons and one of 2,600 tons) in lieu of the tuna vessels.

(2) On October 29, 1964, representatives of a Korean fishing company and a United States processing firm signed an agreement for a loan of \$310,000 for the construction of two 200-ton steel vessels for tuna long-lining. Materials and equipment are to be imported and the vessels are to be constructed in Pusan, Korea, from March to September 1965. In October 1965, the vessels are scheduled to be completed and to sail for fishing grounds near American Samoa where the catch will be delivered to the processing facilities of the United States firm making the loan. The loan terms call for repayment in 5 years at 6-percent interest.

(3) Another Korean fishing company and a United States processor have also negotiated a new agreement whereby the United States company is to make a cash loan of \$1,490,000 to enable the Korean firm to purchase materials to build five 200-ton and five 180-ton tuna-fishing vessels at Pusan. The agreement calls for the Korean Government to subsidize part of the vessels' construction cost, but as of late 1964, the Korean Government had not approved the arrangement. It is believed that the United States and Korean interests will go ahead and build the vessels even if the subsidy is not approved. Terms of the loan call for 6 percent annual interest and repayment in 6 years after a grace period of 2 years. The new vessels built with the loan are to fish off Western Africa in the vicinity of Freetown, Sierra Leone.

(4) Possible foreign financing to build three 350-ton tuna vessels has been discussed by still another Korean firm which is seeking Korean Government approval of the project. Prospects for the proposal were not clear late in 1964.

The initial deliveries of vessels under the agreement between the Korean Government and a French-Italian consortium are expected in early 1965. The agreement, which can be expanded, calls for delivery of 91 vessels for a total of 22,740 gross tons. Those include 76 tuna long-liners, 2 offshore trawlers, and a research laboratory vessel for deep-sea fishing, plus 12 trawlers for fishing in Korea's coastal waters. Delivery is due to be completed in 1967. Vessels received under this agreement are to be managed by the Korea Marine Industrial Development Corporation, a Korean Government corporation. Some of the new vessels will deliver their catches to a United States processor at American Samoa. (United States Embassy, Seoul, December 9, 1964.)

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TRAINING PROGRAM FOR FISHERMEN SPONSORED BY UNITED NATIONS SPECIAL FUND:

On November 13, 1964, representatives of the United Nations Special Fund and the Ko-

Republic of Korea (Contd.):

rean Government signed an agreement for the operation of a fishing training center. The project will be executed by the Food and Agriculture Organization, with the Korean Ministry of Agriculture and Forestry as the cooperating agency. The Special Fund is to contribute US\$1,013,500 and the Korean Government is to provide goods and services valued at \$919,696 for the training center which is to operate for 5 years.

The program at the training center will emphasize fishing techniques, particularly tuna fishing and various types of trawl fishing. The center will be located at Pusan, but most of the training will be given aboard 2 fishing vessels where the trainees will receive instruction and practical training for a period of 6 to 12 months. A tuna long-liner (280 gross tons) and a trawler (150 gross tons) are to be imported to serve as training vessels. FAO is trying to expedite delivery of the training vessels because fishing vessels ordered from France and Italy are scheduled to begin arriving in early 1965. The training program will help supply crews for the new vessels. (United States Embassy, Seoul, November 23, 1964.)



Mexico

EXPANDED FREEZING AND DISTRIBUTION CENTER FOR FISHERY PRODUCTS OPENS NEW MARKETS:

An important new component of the Mexican Government program to bring low-cost seafood to more people is the freezing and storage plant located in Tepepan, a suburb of Mexico City.



Fig. 1 - Headquarters of Frigorificos de Tepepan, the new Mexican distributing center for refrigerated fishery products.

The plant, formerly a general cold-storage installation, was acquired by the Mexican National Consultative Fisheries Commission in mid-1964. The plant has been converted to handle seafood only. Its present freezing capacity is 15 metric tons a day and storage capacity is 750 tons. Both freezing and storage capacity are being doubled with the addition of new buildings and the installation of new refrigeration equipment--mostly of United States manufacture. Investment in the plant is 8 million pesos (US\$640,000).

Three 15-ton tractor-trailer refrigerated trucks have been acquired to haul fresh fish from coastal ports to the plant. During the first few months of operation, fish was brought to the plant by trucks using ice. Ports supplying fish are Mazatlan in Sinaloa, Progreso in Yucatan, and ports in Veracruz State.



Fig. 2 - One of three refrigerated trucks which haul fish from fishing ports to the freezing plant at Tepepan.



Fig. 3 - Plant engineer and general manager of the Tepepan center standing by refrigerated truck. Partly visible on the truck is the slogan, "Bueno... el pescado" (Fish is great). That slogan is broadcast day and night on Mexican radio and television in the campaign to increase fish consumption.

Mexico (Contd.):



Fig. 4 - Shows new construction which will double the freezing and storing capacity of the Tepepan center. At left, a truck unloads Mazatlan fish into the old freezing plant which continues to operate during the new construction.

Most of the fish is received whole. Some is filleted or cut into pieces at the plant. The fish is packed in plyofilm bags for storage and for sale. Shrimp is handled in addition to finfish.

Although a small retail shop is located on the premises, the principal objective of the plant is to act as a distribution center. Twice weekly, pickup trucks fan out from Tepepan for circuits of the cities and towns of the Mexican highlands from the State of Puebla to the State of Guanajuato. The trucks (which may be replaced by better equipment later) deliver seafood on a regular schedule in protein-deficient areas to towns that rarely saw acceptable fish in the past.

According to those in charge, the new program is meeting with great favor, and more fish could be sold than is available. Prices are rather low and considerably under the going prices on the open market in Mexico City. No additional charge is made for fish sold in the outlying areas, as there is one fixed price for each product whether sold in the city or in a country town.

Frigorificos de Tepepan is the first of a series of distribution centers planned by the Mexican Fisheries Commission. If its initial success is sustained, others will be built in strategic locations throughout the country; hauling and distribution truck fleets will be augmented; and production facilities at the fishing ports will be increased. (Regional Fisheries Attache, United States Embassy, Mexico, D.F., December 15, 1964.)

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NEW PORT FACILITY AT ALVARADO (VERACRUZ) COMPLETED:

Mexico's first complete fishing port at Alvarado, Veracruz on the Gulf of Mexico, was inaugurated by Mexico's President Mateos on November 13, 1964. The dedication ceremony on that day marked the end of two years of planning and construction work, the end result being what is considered an up-to-the-minute installation equipped for handling and processing all types of fishery products. The new port facility is administered by the Banco Nacional de Fomento Cooperativo, and was financed by Dutch capital at a reported cost of US\$9.6 million.

Built on some 25 acres of filled land on the shore of a protected harbor 45 miles south of the port city of Veracruz, the "pilot" port has every type of facility for complete fishery operations. Both the buildings and the equipment are modern in every respect, and capable of carrying on every activity connected with the production of marine products. Facilities include (1) docks for unloading and servicing fishing vessels;

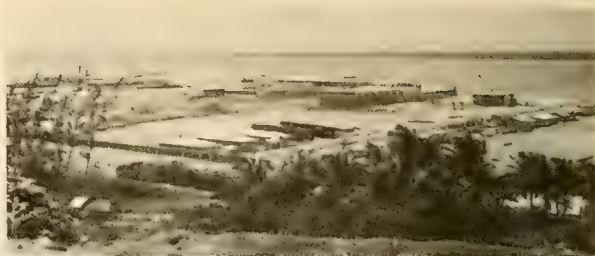


Fig. 1 - Alvarado fishing Port--left to right, boat dock, marine ways and net locker, mooring inlet, offices for fish buyers, ice plant, fish receiving and auction area, fillet lines, processing plants (freezing, canning, salting, smoking, drying), reduction plant for offal.

(2) dredged channels and a protected mooring basin; (3) boat-yard and marine ways capable of handling large fishing vessels; (4) machine shops; (5) net and gear building (with adequate space both indoors and outside for making and drying nets); (6) offices for fish buyers; (7) ice making plant; (8) ice-storage and crushing facilities and for loading boats and trucks; (9) fish unloading conveyors and sorting area; (10) auction area for fresh fish; (11) filleting lines; (12) freezers and cold storage; (13) a canning line and smokehouses; (14) artificial dryers; (15) salting and pickling facilities; (16) a meal and oil plant for fish waste; (17) central offices, dining room, kitchen, and dormitories; (18) auxiliary electric plant; and (19) paved roads and rails connecting all areas. One of the more important facilities is a well equipped quality control laboratory to be staffed by experienced technologists.

The cost breakdown is reported as: (1) dredging, filling, compacting and leveling the land US\$3,598,000; (2) construction of buildings and cost of equipment \$2,310,000; (3) 5 fishing vessels \$1,604,000; (4) nets and other fishing gear, radio communications, 5 refrigerated trucks \$1,168,000; (5) elevated water tank, water system, streets, railways, etc. \$959,000. Of the total, 75 percent of the funds were spent in Mexico and 25 per-



Fig. 2 - Second of 5 Dutch-built all-purpose fishing vessels for new fishing port--about 100 feet long.

Mexico (Contd.):

cent went toward purchases of vessels and plant equipment abroad, much of it in the Netherlands but some in West Germany and Great Britain and a little in the United States. A Netherlands bank provided 85 percent of the financing and the company that built the port provided the remainder.

The planned capacity of the plant is over 100 tons of fish a day as it is received from the vessels. Adequate space is provided for doubling the capacity of any and all units of production. For example, if the market for any particular product should increase, additional equipment can be installed to put out that product. Original daily capacity is reported to be: fresh fish auction sales, 80 metric tons; cleaning and filleting lines, 48 tons; freezing, 32 tons; canning, 12.5 tons; drying and salting, 16 tons; smoking (hot and cold smoke), 4 tons; reduction plant for waste and inedible fish, 25 tons of raw material; ice, 100 tons. Storage is provided for 298 tons of refrigerated fish, 400 tons of frozen fish, and 350 tons of ice.



Fig. 3 - View of port from dock at net locker, across from mooring basin. Buyers' offices center foreground, ice plant at left, unloading conveyors at extreme left.



Fig. 4 - Net loft at new fishing port.

The fishing fleet to supply the plant will consist initially of 2 local wooden trawlers and 5 steel trawlers built in the Netherlands. Two trawlers from the Netherlands have already been delivered. The vessel *Alvarado* has been conducting exploratory fishing and gear tests since January 1964, as have the local trawlers. Another vessel, the *Tlacotalpan*, is being outfitted for early operations, and the other 3 are due for early delivery from the Netherlands. The steel vessels are modern in every respect, carry a variety of electronic aids to navigation and fishing, and can be used with all types of gear. Their reported cost of \$320,000 each represents a considerable portion of the total investment in the port. In addition to the project fleet, the plant also plans to buy fish from local trawlers and canoes.

The technical director of the project, both the plant and the fleet, is the former director of the marine station of the Veracruz Institute of Technology. The Food and Agriculture Organization has provided some administrative assistance and has furnished an expert master fisherman to design and demonstrate new kinds of gear and help train local fishermen in their use.

With good highway and rail connections to Mexico City, Puebla, Veracruz, and other centers of populations, Alvarado is expected to play a key role in Mexico's campaign to supply more fishery products to supplement the protein diet of the people.

The director of the National Bank for the Development of Cooperatives, who is in overall charge of the project, has listed the following objectives: (1) a regulator for supplying fish to the centers of consumption; (2) concentrate the production of the Gulf of Mexico, by means of which the stature of the fisheries will be raised; (3) offer the fishermen a guaranteed price; (4) control the sanitary quality of marine products; (5) regulate fish prices; (6) contribute to the supply of fish for the inland consumer at low prices; (7) provide installations and services that will encourage investment in vessels by private owners and cooperatives; (8) promote experiments in modern fishing techniques for the fisheries of the Gulf of Mexico and in methods of industrial packing, for the purpose of planning other installations in other coastal areas. (Fisheries Attache, United States Embassy, Mexico, D. F., November 19, 1964.)

Note: See *Commercial Fisheries Review*, September 1964 p. 84.



Norway

FISHERIES TRENDS, NOVEMBER 1964:

Fish Stick Production Plant in Trondheim:

A company which was established in 1963 for large-scale production of fish sticks has decided to build a processing plant in Trondheim. The company is owned by a number of fish freezing companies in north Norway and it is affiliated with the marketing organization for more than 100 Norwegian fish processing plants.

The new company plans to start operations at Trondheim in February 1965 with an initial plant capacity of about 2,000 metric tons of fish sticks annually, to be increased to an annual output of 10,000 tons.

Norwegian Fishing Off the Coast of West Africa: Experimental trawling by 2 Norwegian and 1 Israeli fishing company off the coast of West Africa during the last 3 years has shown promising results and the cooperating companies have now decided to put the operation on a permanent basis. The group has reported plans to operate freezer-trawlers and line-fishing vessels off Africa. The group has recently opened an office in Las Palmas on the Canary Islands, and fishing will take place in the area between the Canaries and Dakar. At present the group operates one trawler, the *Havkvern*. (United States Embassy, Oslo, December 3, 1964.)

Herring Oil: Norwegian production of herring oil during the first 9 months of 1964 increased to 68,900 short tons from 47,400 tons in January-September 1963. (U. S. Department of Agriculture.)

Norway (Contd.):

Canning Firms May Sponsor Joint Foreign Sales Promotion: Two leading fish canneries in Sweden and Norway have agreed to coordinate their production and distribution. Possibilities for developing joint foreign sales promotion will also be explored. (News of Norway, December 3, 1964.)

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EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-JUNE 1964:

Norway's exports of canned fishery products in January-June 1964 were up 9 percent in both quantity and value from those in the same period of 1963. The gain was mainly due to larger shipments of smoked brisling

and soft herring roe. A decline in exports of smoked sild in oil was offset by a gain in exports of sild sardines packed in other styles.

The leading buyers of Norwegian canned fishery products in the first half of 1964 continued to be the United States and the United Kingdom. (Norwegian Cannery Export Journal, September 1964.)

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SALMON SEASON GOOD:

With Norwegian fishermen enjoying one of their best salmon seasons in many years, estimates indicated that Norwegian exports of fresh and frozen salmon in 1964 would reach 1,000 metric tons with a value of £1.6 million

Table 1 - Norwegian Exports of Canned Fishery Products by Type, January-June 1964 and 1963

Product	January-June 1964			January-June 1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
Smoked brisling in oil	2,540	17,262	2,414	2,224	15,559	2,176
Smoked brisling in tomato	349	1,930	270	139	778	109
Smoked small sild in oil	4,924	20,656	2,889	5,552	23,338	3,264
Smoked small sild in tomato	989	3,477	486	590	2,116	295
Unsmoked small sild in oil	214	723	101	112	391	55
Small sild packed otherwise	242	891	125	15	56	8
Kippered herring (Kippers)	1,530	6,695	936	1,570	6,539	914
Mackerel	327	1,563	219	330	1,557	218
Roe, unclassified	816	3,284	459	789	2,821	395
Soft herring roe	957	4,631	648	473	2,293	321
Fish balls	250	641	90	270	700	98
Other canned fish	58	411	57	86	641	90
Shellfish	830	8,610	1,204	766	8,330	1,165
Total	14,026	70,774	9,898	12,916	65,119	9,108

Table 2 - Norwegian Exports of Canned Fishery Products^{1/} by Country of Destination, January-June 1964 and 1963

Country of Destination	January-June 1964			January-June 1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Kroner	US\$1,000	Metric Tons	1,000 Kroner	US\$1,000
Finland	166	838	117	59	392	55
Sweden	281	1,261	176	156	817	115
Belgium-Luxembourg	333	1,593	223	345	1,632	228
Ireland	165	599	84	130	414	58
France	126	509	71	149	617	86
Netherlands	87	300	42	92	320	45
United Kingdom	3,406	15,932	2,228	2,337	9,839	1,376
Japan	9	42	6	170	800	112
West Germany	373	1,420	199	337	1,258	176
East Germany	-	-	-	982	3,532	494
South Africa Republic	898	3,545	495	671	2,806	392
Iraq	68	258	36	7	27	4
Canada	432	2,688	376	331	2,019	282
United States	4,707	25,576	3,577	5,566	29,349	4,105
Australia	713	2,919	408	713	2,841	397
New Zealand	174	750	105	246	1,060	148
Other Countries	1,676	6,055	847	527	2,010	281
Total ^{2/}	13,614	64,285	8,990	12,818	59,733	8,354

^{1/} Does not include exports of canned shellfish.

^{2/} Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: Norwegian kroner 7.15 equals US\$1.00.

Norway (Contd.):

(US\$4,480,000). Norwegian salmon exports in 1963 were reported as 856 tons.

Prices to Norwegian fishermen during 1964 for large salmon reached 16-20 shilling per kilo (US\$1.02-1.27 per pound), according to reports. (Fishing News, London, October 2, 1964.)

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FISH MEAL INDUSTRY TRENDS, 1964:

Norwegian total fish meal exports in 1964 may reach 150,000 metric tons and Norwegian sales of fish oil are also expected to reach a high level, according to the Norwegian Ministry of Fisheries. In the first half of 1964, Norwegian exports of fish meal totaled about 100,000 tons valued at £5 million (US\$14 million). Norwegian total fish meal exports in 1963 amounted to about 100,000 tons. (Fishing News, London, October 2, 1964.)

(Editor's Note: Norwegian production of fish meal in January-September 1964 totaled 147,000 tons compared to 102,000 tons in the same period of 1963, according to preliminary data from the International Association of Fish Meal Manufacturers.)



Peru

FISH MEAL AND OIL INDUSTRY TRENDS AND OUTLOOK, OCTOBER 1964:

Peruvian fish meal production picked up sharply in October 1964 as the usual third quarter seasonal slump in anchoveta fishing ended. In the first 10 months of 1964, Peruvian fish meal production was up 32 percent from that in January-October 1963. Anchoveta fishing is usually good late in the year so total Peruvian fish meal production in 1964 may reach a record 1.5 million metric tons.

Peruvian fish meal exports through the first 10 months of 1964 totaled almost 1.2 million tons, up 23 percent from the same period in 1963.

Prices for Peruvian fish meal in November 1964 continued to ease off from the high levels of late September 1964. Two factors may have helped reduce fish meal prices.



Fig. 1 - Anchovetas being pumped from fishing vessel directly into the truck at Callao.

First, soybean meal prices declined in the United States. Since fish meal and soybean meal can, within limits, be substituted for one another in the preparation of commercial animal feeds, demand for fish meal has been affected. Second, there were reports of European speculative buying of fish meal during the July-September months when anchoveta



Fig. 2 - Conveyor belt system is being used to transport anchovetas into fish meal plant for processing at Chimbote.

fishing usually slumps in Peru. Apparently, the demand anticipated by certain fish meal dealers did not materialize and prices declined under pressure. Spot prices in late November 1964 for fish meal f.o.b. Peru were reported in the US\$110 range, with demand for forward shipments reportedly light. (Editor's Note: Earlier reports indicate that the

Peru (Contd.):

Consorcio Pesquero del Peru S. A. has already sold over 500,000 tons of fish meal forward for the first half of 1965.)

Peruvian Fish Meal Production and Exports, January-October 1963-64				
Item	October		Jan.-Oct.	
	1964	1963	1964	1963
	... (1,000 Metric Tons) ...			
Production	130	77	1,190	904
Exports	84	83	1,183	963

Peruvian fish oil exports in January-October 1964 totaled 100,000 metric tons including 15,000 tons of crude oil and 85,000 tons of semirefined oil. By way of comparison, Peruvian fish oil exports totaled 110,000 tons in all of 1963 and 151,000 tons in the year 1962. (United States Embassy, Lima, November 30, 1964.)



Poland

FISHERIES TRENDS, SEPTEMBER 1964:

African Trawling: The Polish freezer-trawlers Belona, Barakuda, Dorada, and Albakora began fishing off the North African coast in September 1964. The four vessels planned to sell part of their catches in Nigeria, Ghana, and Liberia.

In early September 1964, the Polish trawlers Wieczno sailed from Swinoujscie for fisheries explorations off West Africa. Aboard the vessel was a team of scientists from the Polish Sea Fisheries Institute.

Harbor Expansion Project at Szczecin:

The Polish Government has approved a plan for expansion of the fishing harbor at Szczecin, a Baltic port which serves as a base for offshore fishing vessels. The plan calls for 500 million zloty (US\$125 million at the official Polish rate of exchange) to be spent during 1966-1980 for expansion, modernization, and new facilities at Szczecin.

Bulgaria Included in Soviet Bloc Cooperative Fishery Agreement: Officials of Poland, the Soviet Union, and the German Democratic Republic met in Riga (Soviet Union) in early September 1964 for a session of their Joint Committee on fisheries cooperation. Their

tripartite agreement on fisheries cooperation was extended to include Bulgaria. (Polish Maritime News, No. 74, October 1964.)

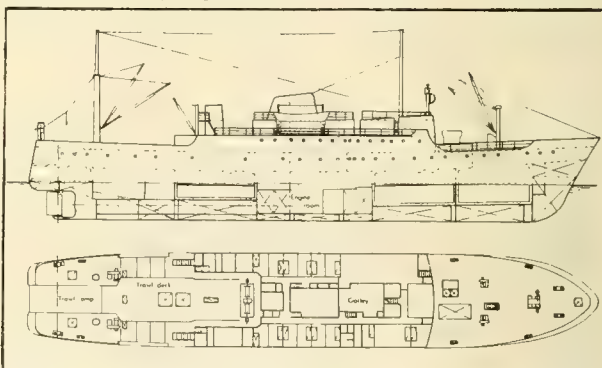
NEW FACTORY-TRAWLER
LAUNCHED AT GDANSK:

In late August 1964, the Polish shipyard at Gdansk launched the factory-trawler Andromeda. The new vessel was the 11th successive factory-trawler built by the Gdansk Shipyard for the "Dalmor" Deep-Sea Fishery Cooperative of Gdynia.

Dalmor of Gdynia is Poland's largest fishery cooperative. With a quota of 64,000 metric tons of fish in 1964, crews of Dalmor's factory-trawlers and trawlers had landed 54,000 tons of fish by mid-September 1964. (Polish Maritime News, No. 74, October 1964.)

SIZE OF FISHING FLEET, 1961-1963
AND ESTIMATES FOR 1964:

Poland's fishing fleet continued to expand in 1963 and even greater expansion was ex-



Profile and deck plan of a Polish fishing factory trawler, Type B-26. Overall length 272 feet.

Poland's Fleet of Fishing Vessels, 1950, 1955, and 1961-1963					
Type of Vessel	1963	1962	1961	1955	1950
	... (Number of Vessels) ...				
Factory trawlers	7	5	2	-	-
Super trawler	52	53	53	8	-
Other trawlers	24	22	15	20	24
Lugger-trawlers	46	46	46	34	-
Luggers	-	1	3	3	3
Cutters	546	545	538	397	338
Auxiliary vessels	3	3	3	2	-
Total	678	675	660	464	365
Total gross registered tons	120,400	110,700	91,700	43,200	18,200

Source: Maly Rocznik Statystyczny, 1962 and 1963.

Poland (Contd.):

pected in 1964. Construction timetables called for the delivery to the Polish fleet in 1964 of 3 "B-15-type" factory-trawlers, 1 "B-18-type" large freezer-trawler, and 6 "B-23-type" freezer-trawlers, as well as seven 2½-meter cutters. (United States Consulate, Poznan, November 25, 1964, and Polish Maritime News, No. 65 and No. 66.)

Note: See Commercial Fisheries Review, Nov. 1964 p. 107 and June 1964 p. 55.



South-West Africa

PILCHARD AND ANCHOVY FISHERY TRENDS, SEPTEMBER 1964:

Pilchard: By September 1964, 6 of the 8 pilchard processors in South-West Africa had taken their 1964 pilchard catch quota of 90,000 short tons. They reported a catch of exceptionally high quality yielding nearly 30 gallons of fish oil per ton of fish during the height of the season. The remaining 2 factories were expected to take their quotas by mid-October and mid-November 1964 to bring the total 1964 pilchard catch in South-West Africa to a record 720,000 tons. The industry expected to easily dispose of its record production. There is a strong demand for South-West African fish meal, and South-West African producers also have an order for about one million cases of canned pilchards for the Philippines.

Frozen pilchards were exported by South-West Africa for the first time in September 1964. The first shipment consisted of 170 tons for Liverpool, England, by a Walvis Bay



Fig. 2 - A 51-foot forward-cabin pilchard fishing vessel, built in Cape Town, operating off Walvis Bay.

factory which has a license to catch 5,000 tons of pilchards for export in frozen form.

Anchovy: By the end of September 1964 there were five fishing vessels engaged in catching anchovy off the South-West African coast. The vessels were having some difficulty handling the heavy purse-seine net and equipment in rough seas.

The quality of the anchovy caught in September did not come up to expectations. However, with the advent of warmer weather in October 1964, the anchovy appeared to be im-



Fig. 1 - Vessel mooring jetties and canning and reduction plant on the banks of the Berg River.

South-West Africa (Contd.):

proving in quality; larger catches were also made in early October.

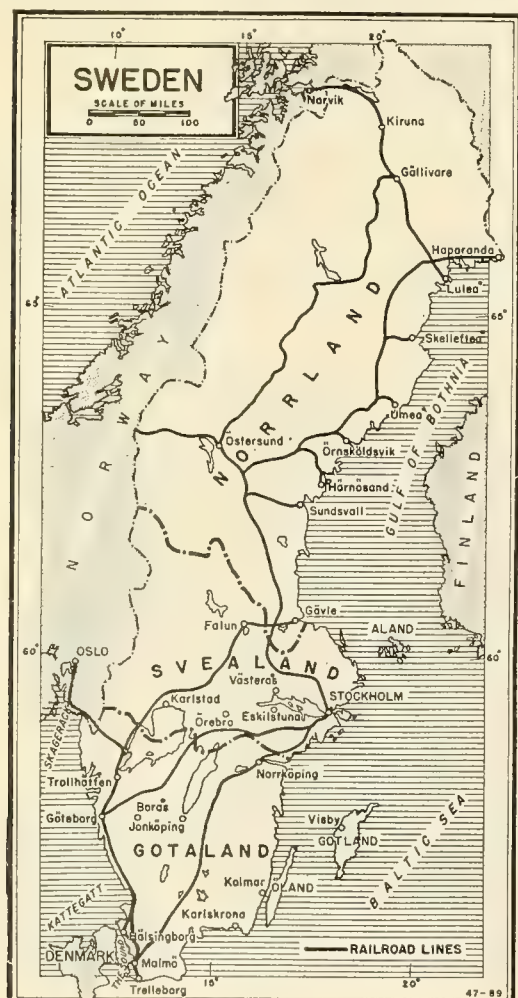
The South-West African Administration has granted the 7 pilchard processing factories at Walvis Bay permission to operate 2 anchovy nets each. No restriction has yet been laid on the quantity to be caught or the season in which catches may be made. (South African Shipping News and Fishing Industry Review, October 1964.)



Sweden

SHRIMP INDUSTRY TRENDS:

Swedish consumption of shrimp--fresh, frozen, or otherwise preserved--has been growing steadily during recent years. Swedish shrimp production satisfies a relatively small portion of domestic requirements so



Sweden Exports of Shrimp, January-June 1964	
Country of Destination	Quantity
	Metric Tons
United States	2
Norway	14
Denmark	41
Finland	18
West Germany	7
Netherlands	1
United Kingdom	17
France	7
Portugal	1
Italy	5
Switzerland	13
Austria	5
Australia	2
Total	133

there is a rather substantial volume of imports. Swedish imports of shrimp during the first 6 months of 1964 totaled 1,139 metric tons, of which Norway supplied 812 tons. Swedish exports of shrimp are small--amounted during the first half of 1964 to 133 tons, of which the United States received only 2 tons. Sweden's fishing industry (including shrimp) is concentrated along the southwest coast in the vicinity of Göteborg. (United States Embassy, Stockholm, December 1, 1964.)



U.S.S.R.

NEW FREEZER-TRAWLERS FOR SOVIETS BUILT IN DENM.

The 2,550-ton freezer-trawlers M/S Gletcher and M/S Zelenoborsk were launched November 26, 1964, by a Copenhagen shipyard for V/O Sudoimport, Moscow. The vessels

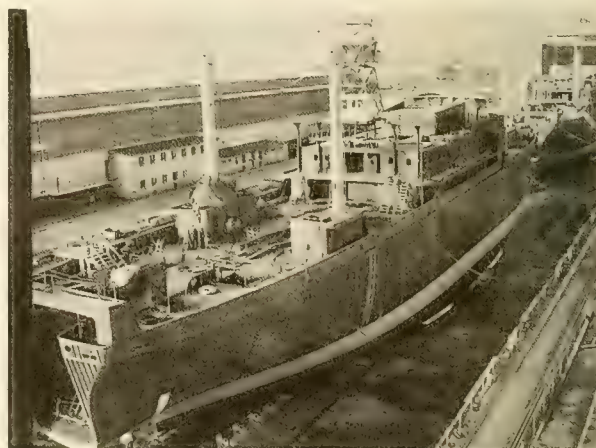


Fig. 1 - M/S Gletcher and M/S Zelenoborsk under construction in Copenhagen.

U.S.S.R. (Contd.):

were the 9th and 10th in a series of 11 freezer-trawlers for the U.S.S.R. being built by the Danish shipyard to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 tons.

The M/S Grumant, the 5th vessel in the series, was completed and delivered to Sudoimport, Moscow, December 7, 1964.



Fig. 2 - New Soviet freezer-trawler M/S Grumant. The vessel has a speed of 14 knots.

The first vessel in the series was the M/S Skryplev, launched May 10, 1962. Another series of 4 freezer-trawlers has been ordered by the Soviets from the Danish shipyard for delivery in 1966.

Since 1932, the Copenhagen shipyard has launched 43 vessels for Sudoimport, of which 31 were fish-freezer vessels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, December 9 and 15, 1964.)



West Africa

CANNED SARDINE INDUSTRY OUTLOOK:

Summary: Sardines are believed to be plentiful all along the Atlantic Coast of West Africa, but Morocco and the South Africa Republic are the only countries in the area with a significant canned sardine industry. (In Africa the term sardine includes the Sardina pilchardus of Morocco, the Sardinella aurita and Sardinella eba of the Gulf of Guinea, and the Sardinops or pilchard of the South Africa Republic.)

No large increase in canned sardine production in West African countries is expected in the near future. Senegal and Ghana have plans for entering the canned sardine industry, but their effect on the world market will probably be slight. A small cannery in the Congo may resume sardine packing, but its capacity is very small. In the South Africa Republic, production is expected to keep pace with world demand and perhaps show a moderate increase. On the other hand, the Moroccan canned sardine industry may not be able to survive if it loses its special privileges in the French market.

Morocco: The Moroccan canned sardine industry produces for the export market. Moroccan canned sardine exports have ranged from 1.4 million cases during the 1955/56 season to 2.1 million cases in the 1962/63 season. Moroccan sardines are usually canned in oil in 4.5-ounce or 3.75-ounce cans (100 cans to the case).

A total of 700,000 cases of Moroccan sardines is allowed to enter France duty-free each year. In the 1962/63 season, Moroccan canned sardine exports to France amounted to 759,766 cases; other leading buyers were Ghana with 201,171 cases, West Germany with 234,197 cases, Italy with 100,974 cases, the Soviet Union with 87,698 cases, and Madagascar with 65,386 cases. Morocco exported only 26,152 cases of canned sardines to the United States in 1962/63.

The Moroccan canned sardine industry in 1963 consisted of 80 plants supported by a fishing fleet of about 195 vessels--mostly Diesel-powered purse-seiners ranging in length from 15 to 18 meters (49 to 59 feet).

Production and export quotas for each sardine plant are assigned by the Moroccan Government, based upon the French duty-free quota, general market conditions, and carryover inventories. For some years, exports to France have been the mainstay of the Moroccan canned sardine industry. One report indicated that the profit per case for Moroccan exports to France has been as high as US\$5.50, while canned sardine exports to other countries often result in losses. The continuation of the duty-free French market is obviously of critical importance to the Moroccan industry. Associate membership for Morocco in the European Common Market would probably result in continued access to the French market and even in opening up of other Common Market countries to Moroccan sardines on the same basis. But Morocco may be reluctant to join the European Common Market because of an unfavorable trade balance. It is expected that this question will be resolved one way or the other by 1966 or 1967.

To survive without the privileged French market, the Moroccan sardine industry would have to reorganize its entire canning program to improve efficiency, cut costs, and achieve a competitive position in the world market. As an alternative, the Moroccan sardine industry might consider switching to fish meal and oil production exclusively.

South Africa Republic: Canneries in the South Africa Republic account for roughly 10 percent of world production of canned sardines and herring-like fish. The South Africa Republic (including the Territory of South-West Africa) produced 50,586 short tons of canned pilchards in January-June 1964 (the main canning season), as compared with 40,498 short tons in the year 1963. Accounting for the bulk of South African production, the 8 plants in South-West Africa packed 47,859 short tons of pilchards in January-June 1964 and 32,053 short tons in the year 1963. The remainder of the South African production was canned in 15 plants on the Cape west coast. Most of the pilchard pack was canned as 1-pound talls and 1-pound ovals in tomato sauce.

In 1963, the South Africa Republic exported a total of 25,673 short tons of canned pilchards valued at US\$7.4 million. The leading buyers were the United States, the United Kingdom, Belgium, Italy, and Asian countries such as the Philippines.

Production and exports of canned sardines in the South Africa Republic are regulated by the South African Cannery Association. That group assigns production quotas to individual

West Africa (Contd.):

plants, allocates orders for exports, and handles sales of all canned fishery products. Some sales assistance is provided by the Export Promotion Division of the Government Department of Commerce and Industry.

Senegal: Limited production of canned sardines has been started by a tuna cannery in Senegal which hopes to export canned sardines to France, Nigeria, the Ivory Coast, and Ghana. But a small purse-seiner based at Dakar is the only vessel in Senegal now fishing for sardines (aside from the traditional canoe fleet). The present Senegalese ex-vessel sardine price of about US\$48 per metric ton is considered high for large-scale canning. The Government of Senegal hopes to reduce that price to about US\$24 per metric ton by subsidizing local construction of fishing vessels of 30 meters (98 feet). New vessels are to be sold on easy credit terms to local cooperatives. One of the new vessels should be completed in 1965, and two each in subsequent years. If the sardine ex-vessel price drops, the Senegalese Government plans to subsidize at least one sardine canning plant.

Ghana: Construction of two sardine canneries has started in Ghana. A total pack of 9,720 metric tons of canned sardines per year is scheduled at the plants when they enter production. Completion of the plants is scheduled for the end of 1965, with production to start early in 1966. Nationalization of Ghana's fishing industry is virtually complete and a number of ambitious plans have been announced for the development of the industry. Sardine canning is prominent among those. Carrying out the plans, however, will require the solution of several problems, such as the severe foreign exchange difficulties. Another problem is the comparatively high prices set for fish by the Ghana Fishing Corporation. A wholesale price list of that company dated September 1, 1964, listed frozen sardines packed in 30-kilogram (66-pound) cartons at approximately 17 U.S. cents per pound. A drastic change in price structure, plus a sizable increase in production, will obviously be necessary for an economically successful canning operation in Ghana.

Congo: At Pointe-Noire in the Congo there is a small tuna and pilchard cannery which has operated in recent years on a somewhat spotty basis. Its production is sold mostly in the countries of the Union of Equatorial Africa. The plant has a daily canned pilchard capacity of about 5,000 cans (1-pound ovals) in tomato sauce. In 1961 a total of 215 metric tons of canned pilchards was produced by the plant. In the summer of 1964 after a lapse of two years in pilchard production, the cannery reported plans for a resumption of pilchard canning on a limited basis. (Fisheries Attache, United States Embassy, Abidjan, November 20, 1964.)

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FISH MEAL AND OIL INDUSTRY OUTLOOK AND GENERAL FISHERIES SITUATION:

Summary: With the recent awakening of most of the developing West African countries to the potential of their fishery resources, some important developments are certain to be realized in the next few years. These, however, are not expected to have any disturbing effect on the world fish meal and oil industry. In Western Africa, the major developments will probably take place in the field of fish for human consumption. A protein deficiency and a growing population will create strong demands for low-cost food from the sea.

As of November 1964, production of fish meal and fish oil along the western coast of

Africa was confined to four areas: the South Africa Republic (including South-West Africa), Angola (a Province of Portugal), Morocco, and the Canary Islands (a Province of Spain). Following are fish meal and oil production data in those areas in 1962-1963:

Country	Fish Meal		Fish Oil	
	1963	1962	1963	1962
	1,000 (Metric Tons)		. (Short Tons)	
South Africa Republic:				
Cape West Coast	100	1/	28,000	39,600
South-West Africa	137	1/	18,500	26,300
Total South Africa Republic	237	207	46,500	65,900
Angola	33	33	3,579	3,676
Morocco	22	18	5,665	4,854
Canary Islands	19	2/	-	-
Total Western Africa	311	258	55,744	74,430
1/Breakdown not available.				
2/Not available.				

The African countries account for roughly 10 or 15 percent of the fish meal and 10 percent of the fish oil produced in the world.

There appears to be no shortage of fish stocks for fish meal and oil production on the west coast of Africa, either in areas of current production or in areas being considered for production. On the contrary, sardine stocks appear to be strikingly abundant, particularly in the Gulf of Guinea. While there are plans for new fish meal plants in Mauritania, Senegal, Ivory Coast, Ghana, and the Canary Islands, none of those will be large enough to have any far-reaching effect on the world market. In the case of the South Africa Republic--the largest producing area--moderate expansion of the fish meal and oil industry is to be expected. Firm control by the South African Government and industry should keep the expansion carefully attuned to world market conditions.

Morocco: Significant expansion in the Moroccan fisheries is not expected in the near future. Although a joint French-Moroccan tuna exploration project is planned, there are no plans to expand the sardine fishery which supplies the Moroccan fish meal industry.

Fishermen of Morocco are reluctant to leave the waters near their home ports (no trip lasts more than 24 hours). As a result, they fail to follow the seasonal movements of the sardine schools. Another factor hampering development of the Moroccan fish meal industry in a competitive world market is the large labor force--both at sea and ashore--imposed by the labor unions with Government

West Africa (Contd.):

approval. Crews of 20 to 24 men are often required aboard vessels well able to operate with a dozen or less.

On the brighter side of the picture is a plant for the production of fish protein concentrate (FPC), or fish flour, built at Agadir with the aid of the Food and Agriculture Organization. The plant, which was scheduled to be completed late in 1964, is to have a capacity of 6,000 to 8,000 metric tons of sardines a year, and is expected to produce from 1,000 to 1,500 metric tons of FPC annually for human consumption. Assuming a quality product and marketing success among the underdeveloped nations of the world, FPC could be a significant factor in the future development of Moroccan fisheries.

Mauritania: Although there is at present no fish meal or oil production in Mauritania, a fishing treaty with Spain signed in February 1964 provides for, among other things, a fish meal plant capable of producing 11,000 metric tons of fish meal annually. Sardinella eba are abundant off Mauritania, particularly in the Port-Etienne area. In addition, the expected expansion of the trawling fleet operating out of Port-Etienne could provide in excess of 50,000 metric tons of "trash" fish annually for fish meal purposes. The completion in the summer of 1964 of a 20-ton per day freezing and processing plant at Port-Etienne, and the scheduled completion of a 75-ton per day freezing plant by late 1964 (about 80 percent complete in July) lend credence to the prediction that by 1967 Port-Etienne will be handling 100,000 metric tons of fish a year for various purposes.

Canary Islands: All of the Canary Islands fish meal production (about 19,000 metric tons in 1963) is shipped to Spain. On the islands of Gran Canaria, Tenerife, and Lanzarote there are a total of 16 fish meal plants. A US\$8 million fishing port expansion plan at Las Palmas, scheduled to be started in 1965, includes plans for at least one new and modern fish meal plant. The port expansion plan at Las Palmas is to be financed in part by the World Bank.

Senegal: There is no current production of fish meal or fish oil in Senegal. In the Senegalese development plan for a "tuna complex" at Dakar, however, provision is made for a fish meal plant capable of handling

40,000 metric tons of "trash" fish and 22,500 metric tons of tuna waste annually, with a production of 12,500 metric tons of fish meal a year. But the likelihood of that much fish meal actually being produced is considered rather slim in view of (1) the demand for practically all of the present Senegalese fish catch for human consumption; (2) the preference of the Senegalese Government for a pet food industry rather than a fish meal plant; and (3) the uncertain status of the proposed "tuna complex."

At Djifere in south Senegal there are also plans for a fish meal plant with a capacity of 50 to 100 metric tons of raw fish daily. But the proposed Djifere Project, which would include a number of processing activities, probably won't be completed for a number of years, since it seems to have a low priority. The Government of Senegal is giving top priority to developing a Senegalese tuna fleet.

Ivory Coast: At Abidjan a comprehensive fisheries development project is actively under way, participated in by both Government and private industry. While the primary emphasis of the project is on processing and freezing, it includes provisions for a fish meal plant with a capacity of 50 metric tons of raw material a day. A new tuna cannery is also envisioned. If raw material for the fish meal plant is limited to tuna and processing waste, Ivory Coast fish meal production will be of minor importance in the world picture. However, during the several months when heavy catches of Sardinella eba and Sardinella aurita are taken from the abundant stocks in nearby waters, it is quite possible that some sardine landings would be diverted to fish meal manufacture. The traditional floor price in the Ivory Coast for sardines for human consumption is about US\$72 per metric ton, but vessels are subject to production limits. Therefore, during the heavy production season (about 3 months in the fall) a fish meal plant buying sardines might be attractive to the fishing fleet, even at ex-vessel prices of \$15 to \$20 a metric ton. This is still a future project, however, since it is not expected that such a plant will be built for at least two years.

Ghana: This country presents a different picture from any of the other West African fishing countries. Having now completely nationalized its fisheries under the Ghana Fishing Corporation, Ghana has started an ambitious program of fisheries development. This involves adding some 44 offshore vessels

West Africa (Contd.):

(trawlers and purse-seiners) to its fleet, and constructing 2 canneries, a smoked fish plant, a fried fish section, cold-storage plant, and a fish meal plant, all at Tema. It is believed that the fish meal plant will operate on an intake of some 30 metric tons of fish waste per day from canning and processing operations, in which case meal production would be of little importance. As in other areas of the Gulf of Guinea, sardines are abundant off Ghana. However, current sardine landings in Ghana are in strong demand for human consumption at prices normally of about 1 shilling (14 U.S. cents) a pound. Even with a very radical price drop, it is difficult to conceive of Ghana using sardines for fish meal or canning. As an added complication, Ghana's monetary and foreign exchange problems make it extremely doubtful that its fish meal or oil activities will have any appreciable impact on the competitive world market in the near future.

Angola: Having been severely hit by the world fish meal crisis of the early 1960's, Angola's fishing industry is still in a rather depressed condition. Fish meal production in Angola during January-September 1964, however, was estimated at 42,000 metric tons, which was more than double that in the same period of 1963. Stocks of horse mackerel, sardines, and pilchards--the three species going for meal and oil in Angola--appear to be holding up well, but there are no plans for a significant increase in production.

South-West Africa: As was noted previously, South-West Africa (a Territory of the South Africa Republic) is the major producer of fish meal on the African continent. South-West Africa is favored with an extensive continental shelf and an upwelling of the Benguela Current which provides an abundance of fish, particularly pilchard, for fish meal and oil. The industry is tightly controlled, both by Government regulations and by trade associations. At Walvis Bay there are now seven plants producing fish meal and oil. At Luderitz, farther south, there is one new fish meal plant. Each of those plants is assigned an annual catch quota of 90,000 short tons of pilchards. It is expected that the fish meal industry of South-West Africa combined with that of the Cape West Coast will come close to filling the 1964 export quota of 300,000 short tons of fish meal assigned by the Fish Meal Exporters Organization to the South Africa Republic and South-West Africa combined.

In addition to fishing for their quota of pilchards, some of the Walvis Bay plants have experimented with the newly developing anchovy fishery which is not subject to quota. The new anchovy fishery has allowed several of the plants to extend their fishing season and their meal production. Although the presence of anchovy has been known for at least 10 years, they were not fished until late in 1963. Stocks of pilchard are still considered to be large, but an effort is being made to diversify the fisheries in order not to place too much dependence on a single species. It is widely believed that pilchard stocks in South-West African waters are adequate for present operations and for expanded production if necessary. Under the system of Government and industry controls, however, such expansion will take place only if world market conditions indicate its desirability.

South Africa Republic: Like South-West Africa, the Cape West Coast of the South Africa Republic enjoys favorable fishing conditions and abundant stocks of pilchards, maasbanker, and mackerel. With 17 plants producing fish meal and oil on the Cape West Coast, production is controlled by limiting the pilchard season to the period from January 1 to July 31. In addition, during the special maasbanker and mackerel fishing season from November 1 to December 31 the catch may include 10 percent pilchard.

Experimental anchovy fishing, under strict control of the South African Fisheries Development Corporation, was started in October 1963 and has continued on an expanded basis. Some say that the presence of anchovy in substantial numbers may harm the pilchard resource since both fish compete for the same feed.

But that is only speculation, and for the time being operations are continuing on the basis of a controlled season for pilchard, supplemented by an anchovy fishery in its developing stages. It would appear that this will tend to increase fish meal and oil production but only within limits firmly established by Government and industry controls. (Fishes Attache, United States Embassy, Abidjan, November 13, 1964.)





FEDERAL ACTIONS



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

TENTATIVE ORDER ESTABLISHING DEFINITIONS AND STANDARDS OF IDENTITY FOR FROZEN BREADED SHRIMP:

Proposed findings of fact, conclusions, and a tentative order establishing definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp (as an addition to Title 21, Code of Federal Regulations, Part 36) were published in the Federal Register, December 22, 1964, by the U. S. Food and Drug Administration.

The tentative order states that "frozen raw breaded shrimp" shall contain not less than 50 percent shrimp material, and "frozen raw lightly breaded shrimp" shall contain not less than 65 percent shrimp material.

The term "shrimp" is said to mean the tail portion of properly prepared shrimp of commercial species. The optional forms of shrimp which may be processed in the breaded and lightly breaded categories are: (1) fantail or butterfly; (2) butterfly, tail off; (3) round; (4) round, tail off; (5) pieces; and (6) composite units. Detailed specifications for each optional form are included in the proposed standard. Batter and breading ingredients are also defined.

The labeling requirements of the proposed standards of identity state that the label shall name the food, as prepared from each of the optional forms of shrimp specified. (For example, "Breaded fantail shrimp," "Breaded butterfly shrimp, tail off," etc.) The word "prawns" may be added in parentheses immediately after the word "shrimp" if the shrimp are of large size. If the shrimp are from a single geographic area the adjectival designation of that area may appear as part of the name; for example, "Breaded Alaskan shrimp sticks."

The labeling requirements state that the optional ingredients used in batter and breading (as specified in the standard of identity) "shall be listed on the principal display panel or panels of the label with such prominence and conspicuousness as to render them likely to be read and understood by the ordinary individual under customary conditions of purchase. . . ."

The proposed standards of identity define methods of determining the percentage of shrimp material in breaded shrimp. The method provided to determine the shrimp content of composite breaded shrimp products (shrimp "logs" or "sticks," for example) is the same as that prescribed in the United States Standards for Grades of Frozen Raw Breaded Fish Portions (50 CFR 266.21 f) published by the U. S. Bureau of Commercial Fisheries. That method provides no correction factor, i.e., the product must contain the required amount of shrimp.

For breaded shrimp products other than composite forms, the Food and Drug Administration proposes a separate method of determining shrimp content which allows a correction factor of 2 percent.

(The United States Standards for Grades of Frozen Raw Breaded Shrimp issued by the U. S. Bureau of Commercial Fisheries are being revised to reflect the provisions in the Food and Drug Administration standards of identity.)

Interested persons were given until January 21, 1965, to file exceptions to the proposed order establishing definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp.

Following are the proposed findings of fact and tentative order establishing definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp as published in the Federal Register, December 22, 1964:

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Food and Drug Administration

[21 CFR Part 36]

[Docket No. FDC-73]

SHELLFISH; FROZEN RAW BREADED AND LIGHTLY BREADED SHRIMP; DEFINITIONS AND STANDARDS OF IDENTITY

Proposed Findings of Fact and Tentative Order

In the matter of establishing definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp:

Notice of proposed rule making was published in the FEDERAL REGISTER of March 31, 1961 (26 F.R. 2722), setting forth proposals of the National Fisheries Institute, Inc., 1614 Twentieth Street NW., Washington 9, D.C., and the National Shrimp Breaders Association, Inc., 624 South Michigan Avenue, Chicago 5, Ill., representing members who are processors of breaded shrimp, for the establishment of definitions and standards of identity for frozen raw breaded shrimp. An order was published in the FEDERAL REGISTER of May 7, 1963 (28 F.R. 4556), promulgating identity standards for frozen raw breaded shrimp (21 CFR 36.30) and for frozen raw lightly breaded shrimp (21 CFR 36.31). Objections to the order were filed, asserting grounds for a public hearing on several issues, and an announcement was published on July 6, 1963 (28 F.R. 6915) staying the order. In response to the notice in the FEDERAL REGISTER of December 21, 1963 (28 F.R. 13940) and following a notice of postponement published in the issue of January 11, 1964 (29 F.R. 297), a hearing was held.

Based upon the evidence received at the hearing and having given consideration to the written arguments and suggested findings, some of which were adopted in whole or in part and some of which were rejected, the Commissioner, pursuant to the authority provided in the Federal Food, Drug, and Cosmetic Act (secs. 401, 701(e), 52 Stat. 1046, 1055 as amended, 70 Stat. 919; 21 U.S.C. 341, 371(e)) delegated to him by the Secretary of Health, Education, and Welfare (21 CFR 2.90; 29 F.R. 471), proposes that the following findings of fact, conclusions, and definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp be issued:

Findings of fact.¹ Frozen raw breaded shrimp and frozen raw lightly breaded shrimp are prepared by coating appropriate forms of peeled shrimp with safe and suitable batter and breading ingredients and then freezing. Only the "tail" portion of shrimp is used. The tail portions are prepared in the following forms:

a. Split or butterfly, with tail fins remaining and with or without first adjoining shell segment.

b. Split or butterfly, tail fins and all shell segments removed.

c. Round, unsplit shrimp with tail fins remaining and with or without first adjoining shell segment.

d. Round, unsplit shrimp, tail fins and all shell segments removed.

e. Pieces of shrimp, tail fins and all shell segments removed.

f. Compositing units consisting of two or more shrimp pieces or whole shrimp or a combination of both with tail fins and all shell segments removed.

Breaded shrimp is a relatively new commercial food, having been first commercially distributed about 1947 or 1948. Breaded shrimp is prepared from either iced or frozen shrimp or both and from one or more of the so-called white, pink, or brown varieties. Shrimp are obtained from many different parts of the world (R. 151-170, 228, 274; Ex. 2, 27).

2. When frozen raw breaded shrimp first appeared on the market it contained appreciably more shrimp material than breading. Due to many factors, including economics and product acceptability, the percentage of shrimp material in the food decreased. However, a small portion of the production was maintained at a higher percentage of shrimp for those purchasers, primarily volume purchasers, such as institutional users, who wanted such higher shrimp percentage (R. 124, 170, 234).

3. After negotiations with industry, the United States Department of the Interior, through its Fish and Wildlife Service, caused to be published United States Standards for Grades of Frozen Raw Breaded Shrimp with an effective date of March 1, 1958. These standards were recodified and republished on July 1, 1958, by the United States Department of the Interior. Within 2 or 3 years after publication of the grade standards, approximately 85 percent of the production of breaded shrimp was being inspected by the United States Department of the Interior for compliance. Among other requirements, the product description of the standards for grades requires a minimum of 50 percent shrimp material as determined by the procedure set out in the grade standards (R. 608; Ex. 26).

4. The Food and Drug Administration order establishing the definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp invited persons claiming to be adversely affected by such order to submit relevant objections specifying with particularity that part of the order to which objection was taken. In the event a hearing should be required on an issue or issues raised by objectors, they were to be prepared to support such objections at the hearing.

A person claiming to be adversely affected by the order objected to the requirement that frozen raw breaded shrimp contain not less than 50 percent shrimp material. He proposed instead that the minimum shrimp material for the food be set at 60 percent. He also objected because the order did not require the size of the raw shrimp used to be listed on the label; because standards were not established for size based on the number of shrimp per pound; because the order did not require the numerical percentage of breading actually in the food to be declared on the label; because it did not require label

statement of the geographic origin of the shrimp; and because it did not limit the time raw frozen shrimp may be held in storage prior to breading.

Others claiming to be adversely affected objected to the order because it did not provide for optional use of alternative names for the food designated as "breaded shrimp pieces"; because it did not provide for the optional use of the alternative designation "breaded round fantail shrimp" for the food designated as "breaded round shrimp"; because it did not specify that size of those large shrimp that the order permitted to be parenthetically designated as "prawns"; and because the method for determination of the percentage of shrimp material in the food included the use of a rubber-tipped glass stirring rod.

The objections were duly noted and set out as issues for the hearing. At the hearing, no objectors or representatives of the objectors, nor any other person supported the objections listed in this finding of fact. Accordingly, there is no basis in the record for changing the order as it concerns these issues (Ex. 2, 4).

5. Some consumers demand breaded shrimp with an appreciably higher proportion of shrimp material than coating. Such lightly breaded shrimp containing not less than 70 percent shrimp material can be prepared. In Federal Specifications, provision is made for the purchase of it and a purchase specification by one of the large grocery chains provides for lightly breaded shrimp with not less than 70 percent shrimp material. However, there was evidence adduced at the hearing that at the 70 percent shrimp material level the present state of the technique of the industry is such that:

a. Only larger size shrimp would satisfactorily lend themselves to being lightly breaded.

b. The coating often shows a number of cracks and voids so that the food would not meet the requirements for Grade A, as set out in the United States Standards for Grades of Frozen Raw Breaded Shrimp.

c. The need for "hand" breading this food increases the price considerably.

d. Packers produce a 70 percent lightly breaded shrimp only upon a customer's order.

On the other hand, breaded shrimp prepared with not less than 65 percent shrimp material substantially overcomes the problems arising with the 70 percent product. Lightly breaded shrimp at the level of 65 percent shrimp material is recognizably different from ordinary breaded shrimp in which the shrimp material amounts to only slightly more than 50 percent (R. 124, 127, 189-192, 219, 234, 235, 238, 320, 325, 532-535, 574, 597-605, 874-876, 918, 1185-1188, 1241, 1244, 1246, 1249, 1250, 1253-1258; Ex. 2, 6, 20, 29-38).

6. Section 403(f) of the Federal Food, Drug, and Cosmetic Act requires mandatory labeling to be placed on food labels with such prominence and conspicuousness as to render it likely to be read and understood under customary conditions of purchase and use. Section 1.9(a) of Title 21, Code of Federal Regulations, points out that this statutory requirement may be offended if required labeling is not shown "on the part or panel of the label which is presented or displayed under customary conditions of purchase." Frozen raw breaded

¹ The citations following each finding of fact refer to the pages of the transcript of testimony and the exhibits received in evidence at the hearing.

shrimp is usually packaged and sold in six-sided packages. Two of the rectangular panels opposite to each other each have a much greater surface area than any of the other four panels. The top one of these panels is ordinarily used as the principal display panel. Principal display panels are easily recognized since they usually carry the manufacturer's brand name, the name of the food in large letters, and often a colorful vignette of the food. In boxes of frozen raw breaded shrimp this panel is sometimes referred to as the main or front panel. Designers of labels and manufacturers of the food intend for this panel to be the one displayed at the point of sale in order to catch the purchaser's eye. It is recognized that sometimes more than one panel is intended for display purposes. Section 403(f) of the act and § 1.9(a) of the regulations apply not only to foods for which there have been established standards of identity but also to nonstandardized foods (R. 179, 180, 290-292; Ex. 21, 22, 41-44, 46-49):

7. Many foods have been defined and standards of identity established in accordance with section 401 of the act. Many of the standards require certain optional ingredients to be listed on the label. A few standardized foods have lengthy lists of optional ingredients providing for many, if not all, to be designated for label declaration. Frozen raw breaded shrimp has a coating that may consist of many ingredients. No objections were received to the order establishing the standard as it concerns the coating ingredients and the provision that it shall be mandatory that they all be listed on labels. The length of the listing of optional ingredients used should not preclude its prominent and conspicuous display. There is substantial evidence of record supporting the placement of the optional ingredient listing on the principal display panel or panels comprising the surface of the label usually displayed to the consumer at the time of purchase. Questions raised concerning the significance and meaning to the consumer of some of the chemical names of certain of the optional ingredients were not sufficient to overcome the need for ready availability of such information to the consumer who seeks such information. The fact that many labels presently used on frozen raw breaded shrimp and other nonstandardized foods do not present the ingredient listing on the principal display panel does not overcome the statutory requirement that the listing be prominent and conspicuous. Evidence of record revealed that the changing of labels or the development of new labels is expensive. However, despite the costs, witnesses revealed that labels are constantly being revised and new labels developed. Some witnesses believed that the order as objected to had required that wherever and as often as the name of the food appeared on the label the ingredient listing must also appear. It was made clear that such listing is to be required only upon the principal display panel (or panels). If the ingredient listing is conspicuously displayed on the principal display panel or panels of the packages of frozen raw breaded shrimp, it is not necessary to require that such labeling immediately precede or follow the name

of the food, without intervening written, printed, or graphic matter. It was asserted that it would be difficult to locate and to read the ingredient listing, regardless of position placement on the label, under certain adverse conditions of frost, light, etc. It is not reasonable to conclude that if such adverse conditions sometimes develop it is unnecessary to prescribe the position placement of such listing. On the other hand, it would be reasonable and in the interest of consumers to prescribe the location of the ingredient listing so that under normal and expected conditions of sale such listing may be easily located and read (R. 66, 72, 78, 80, 81, 83, 94, 142, 180, 183, 186, 241-243, 537, 538, 542, 543, 548, 578, 579, 591, 594, 595, 709, 1070, 1071, 1073, 1075-1080, 1083, 1086, 1090, 1091, 1093, 1095, 1097, 1126, 1127, 1130, 1136, 1138, 1145, 1146, 1160, 1161, 1171, 1174; Ex. 2, 41-44, 46-49).

8. A form of frozen raw breaded shrimp is prepared from two or more whole shrimp, that is, the tail portion of the shrimp with all shell and tail fins removed, or pieces of such shrimp, or both. These units are compressed in a mold, frozen, and coated with a batter and breading. Frozen units, prior to coating, may be cut into smaller units. One such product, prepared from blocks, in its finished form is in the shape of fish sticks and is labeled "shrimp sticks." Another such product is prepared from shrimp caught in Alaskan waters. For this latter product the tail portions are peeled, tail fins removed, placed in a mold, and frozen. The frozen composited units of this shrimp material prepared in Alaska are termed "logs." The logs, in frozen form, are shipped to Ponchatoula, La., where they are then sliced perpendicularly to their long axes. The slices are then individually coated with a batter and breading, refrozen, packaged, and distributed. Each slice consists of many pieces of shrimp. In the approximately two years this product had been on the commercial market prior to the date of hearing, the form and size of the individual serving unit was prepared to resemble that of a "jumbo" shrimp of about "10-15 count." It was asserted that the size of the individual shrimp used is so small that they are unmarketable as single breaded units but do have a commercial market when composited.

The composited units prepared from shrimp caught in Alaskan waters, when breaded, have been sold under the name "Alaskan Breaded Shrimp." There is also on the market a product designated by the manufacturer as "Alaskan Angel Shrimp." This product is packaged frozen and glazed in block form and consists of the individual tail portion of peeled shrimp, tail fins removed. When thawed, the individual uncoated tail portions separate one from another. The witness for the processor stated that the word "Angel" in the name of the food has no meaning or significance. The witness for the packer of the Alaskan products testified that both were prepared from tiny shrimp. However, a size comparison of the pieces of shrimp in the breaded composited units and the single units of glazed shrimp with the size designations found in the United States Standards for Grades of Frozen Raw Headless Shrimp revealed that the composited units and the single units

were prepared from shrimp consisting of a preponderance of medium-size shrimp. Shrimp of such size from other areas are often prepared as individual breaded units. The composited units prepared from shrimp caught in Alaskan waters could be formed into many shapes, including that shape and size known as "sticks." Composited units could be made from small or broken shrimp, or both, from any waters where shrimp are obtained and in the same shape and size as the composited units prepared in Alaska. The geographic origin of the shrimp is not sufficient to disclose to the consumer the form of the shrimp units. For example, the food sold as "Alaskan Breaded Shrimp" and "Alaskan Angel Shrimp" are different forms of the food the former consisting of composited units and the latter consisting of single units. It is reasonable to believe that the uninitiated consumer would be confused and unable to differentiate the forms of the two foods from the names presently appearing on the labels. This follows from the manner in which the geographic origin is used in both names as presently applied to the labels and to the lack of labeling to show the form of the units. It would not be in the consumer's interest to provide in standards that foods prepared in composite form from shrimp obtained from different geographic areas shall bear the same name, such as "Alaskan breaded shrimp," with no additional meaningful description. Further, it would be confusing to the consumer for the order to provide for foods prepared in different geographic areas but in the same manner and having the same form to bear different names; for example, "Alaskan Breaded Shrimp" vs. "Louisiana Breaded Shrimp."

A witness for the Food and Drug Administration testified that personnel of a large chain store have been advertising and selling the composited form of breaded shrimp from Alaska as "jumbo shrimp," without realizing that the units were not single shrimp. The name of the food apparently did not reveal to the sales personnel that the food consisted of composited units. It is not unreasonable to expect that all the various forms of breaded shrimp units encompassed within the order should be indicative of the form of the units, whether it be single split, single round, single pieces, or composited of several whole shrimp or pieces. It would not be contrary to the consumer's interest to provide in the standards that labels may show the geographic origin of the shrimp (R. 634, 641, 644, 646, 650, 652, 655-658, 661-664, 676-678, 681, 682, 686, 689, 699, 1273, 1276-1279, 1283, 1286, 1288, 1289, 1291, 1292, 1294, 1296, 1299-1304; Ex. 2, 20, 23-25, 48, 49, 54, 55, 57-59).

9. In 1958 the United States Department of the Interior published a standard for grades of frozen raw breaded shrimp wherein the product description requires that the finished food contain not less than 50 percent shrimp material. Such requirement has been continued to the date of the hearing and included in the proposal to establish a standard of identity for the food. The method for determining the percentage of shrimp

Note: The 15th line in the above column is a correction published in the *Federal Register*, December 25, 1964.

material in the food is incorporated within the grade standard. This method provides for weighing the finished food; removing the coating by means of an agitating water bath; draining and weighing the debreaded shrimp material; and calculating the percentage of shrimp material. To the result obtained from the calculation of shrimp material provision is made for the addition of 5 percent. (For example, if the calculated result for the finished food is 45 percent shrimp material one then adds 5 percent so that the food is now stated to contain 50 percent shrimp material.) A footnote is appended to the calculation in the published grade standard which states, "A tentative correction factor of 5 percent is employed pending completion of definitive studies" (R. 903, 904, 921; Ex. 1, 26).

10. The petitioners proposing the establishment of a standard for frozen raw breaded shrimp provided for a minimum shrimp material content of not less than 50 percent, to be determined in accordance with the method set out in the United States Standards for Grades, including the 5 percent correction factor. Following publication of the proposed standard of identity, the Commissioner of Food and Drugs, after reviewing comments received and considering other information available to him, published the order establishing the definition and standard of identity. In the Commissioner's order, the correction factor was prescribed as plus 2 percent. The change in this value was objected to by interested parties claiming to be adversely affected and was therefore set up as an issue for the hearing.

Some testimony of record would support the complete deletion of a correction factor, particularly in view of the fact that the product is professed to contain not less than 50 percent of shrimp material. However, the question of deleting the correction factor was not an issue for the hearing, and therefore these findings of fact and conclusions restrict themselves to the question of plus 5 versus plus 2. It is readily recognized that any positive adjustment factor favors the packer. It is reasonable to believe that a packer exercising good commercial controls (good controls of processing are available and are being practiced) would minimize processing variations and therefore can easily produce the finished food well within an adjustment factor of plus 2. For some packers who have been producing a frozen raw breaded shrimp with somewhat less than 50 percent shrimp material a slight increase in weight of shrimp material used will make certain that the consumer will receive a finished food, containing not less than 50 percent shrimp material at the time of purchase. It is well established in the processed food industry that with variable raw materials careful producers do not aim for the lower limits of acceptance because of the dangers inherent in such practice. Since all producers of the food would be subject to the same requirement for minimum shrimp material content, and this percentage will be determined in the same manner, none would be placed at a competitive disadvantage by the changes.

Arguments were advanced that reducing the so-called correction factor from

plus 5 to plus 2 would increase the costs to the consumer. Although the cost to the consumer for frozen raw breaded shrimp has increased through the years, the production and consumption of the food have increased at a greater rate. It is not reasonable to believe that the question of possibly slightly higher costs being passed on to the consumer in return for the inclusion of more shrimp material is germane to the issue, particularly in view of the fact that many packers are presently supplying foods containing in excess of the 50 percent shrimp material requirement. Additionally, it was argued that small differences in the amount of shrimp material were not recognizable to the consumer and therefore the change from plus 5 to plus 2 is unnecessary in the interest of consumers. Opposed to this was the argument that where consumers were unable to protect themselves it is in this area that the standard serves its purpose best by offering such protection from those packers inclined to substitute cheap breading for expensive shrimp (R. 225, 260, 456, 613, 614, 779, 782, 879, 896, 897, 919, 964, 973, 974, 983, 993, 997-999, 1030, 1031, 1050, 1199-1201, 1205, 1216, 1217, 1230, 1236, 1237; Ex. 1, 2, 4).

11. A witness testified that studies he had carried out in preparation for the hearing would not support the plus 2 adjustment factor ordered by the Commissioner. This study had not been published nor had it been available prior to the hearing. The witness proposed that the plus 5 be retained. However, referring to his own studies he stated that such studies were not definitive. An examination of his data and his testimony as a whole revealed many inconsistencies and incompatibilities. One striking segment of his data revealed that of a particular set of 20 samples of frozen raw breaded shrimp 19 were admittedly prepared with less than 50 percent shrimp material. All 20 samples were frozen and stored prior to analysis. Upon analysis for shrimp material content, when plus 5 was added to the result obtained, all 20 samples were reported to contain 50 percent or more of shrimp material. It is readily seen that it would not be in the interest of the consumer to provide for an adjustment factor of plus 5 since, with such factor products intentionally packed to contain less than 50 percent shrimp material would on examination, appear to be in compliance with the shrimp requirement in the standard (R. 439, 733, 757-759, 778, 790, 844, 867, 1201-1204, 1260, 1262; Ex. 40).

12. The record reveals that the correction factor of plus 5 in the United States Standards for Grades of Frozen Raw Breaded Shrimp was both tentative and inadequate to reasonably reflect the shrimp material level in the finished food. As suggested by the footnote to the procedure, the correction factor was not the result of definitive studies. The plus 5 had been included at the time of publication at the request of industry. No witness at the hearing was aware of any work published in support of such plus 5. In fact, it was asserted that the plus 5 was based on admittedly inadequate information (R. 297-299, 963, 994-996, 1195; Ex. 26).

13. Prior to the publication of the Commissioner's order, the Food and Drug Administration was apprised of the details of a study and recommendation by

seafood scientists of the United States Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, concerning the correction factor. Prior to the hearing, the study and recommendation were reported in the Commercial Fisheries Review published by the Bureau of Commercial Fisheries. It was the only published paper, known to the witnesses at the hearing, on the subject. Substantial testimony concerning the investigations reported supports the following:

a. The plus 5 correction factor was only tentative, pending definitive studies.

b. It is desirable to make the correction factor as small as the accuracy of the method will permit to insure uniformity of product.

c. The tentative correction factor of 5 percent is too large.

d. A change in the correction factor from plus 5 to plus 2 more correctly reflects the shrimp content of the finished food.

e. The accuracy of the method for determining the quantity of shrimp material in the finished food warrants the reduction from plus 5 to plus 2.

The study reflects representative commercial handling of the food from preparation to packaging and storage. The published scientific report is definitive of the subject, which was to determine the accuracy of the method for testing samples of frozen raw breaded shrimp in order to reveal the shrimp material content as the consumer receives it. The report embodies a scientific approach to the problem of determining the proper correction factor to be applied in the formula for calculating the amount of shrimp material in breaded shrimp. It is authoritative and reliable. An averaging of results in the report would actually support a slightly negative adjustment factor; that is, on an average basis the percentage of shrimp material in the finished food is slightly higher than that put in at the time of preparation. However, since some samples, when tested, showed a slight decrease in percentage of shrimp material it need not be considered contrary to the promotion of honesty and fair dealing in the interest of consumers to provide a safety factor for the producer by means of an adjustment factor of plus 2. One witness testified that the Bureau of Commercial Fisheries had reviewed the paper and determined that from its accuracy and consideration of the conclusions drawn it warranted publication. Further, prior to publication it had been distributed to representative members of industry for comment and no comments were submitted. Another witness testified that he had personal knowledge of the methods and had personally studied the paper and concluded it supported the conclusions drawn. Further, the data reported had been submitted to statistical analysis and found to warrant the conclusions drawn. The method is reproducible and has a low error. The test is capable of being conducted prior to and at time of consumer purchase and properly reflects the percentage of shrimp material in the food. It is in the interest of consumers to lower the correction factor from plus 5 to plus 2 (R. 780-782, 898-900, 921, 962, 1000-1007, 1049-1051, 1196, 1202, 1212-1223; Ex. 27, 51A-51C).

14. The Commissioner's order required that the method for determining the percentage of shrimp material be the same for all forms of the food provided for, and such method was incorporated in the order. However, substantial evidence of record reveals that the method provided for was not easily applicable to the food in composited form. A witness of the U.S. Department of the Interior testified that the method incorporated in the U.S. Standards for Grades of Frozen Raw Breaded Fish Portions would better reflect the shrimp material content in composited units of raw breaded shrimp. Such method is also provided for in the Federal Specification which covers this item of food (R. 261, 262, 680, 914-916, 1012; Ex. 20, 52).

Conclusions. On the basis of the foregoing findings of fact and taking into consideration the weight of substantial evidence of the entire record, the following conclusions are drawn:

1. Certain objections to the order, which were set up as issues for the hearing, are rejected because the objectors failed to support their objections at the hearing. These objections had been submitted in opposition to the order because:

a. The minimum shrimp material content of frozen raw breaded shrimp should be changed to require a minimum of 60 percent shrimp material.

b. The size of raw shrimp used should be required for label declaration.

c. The order should establish standards for size based on the number of shrimp per pound.

d. Mandatory label declaration of the percentage of breading actually in the package of food should be required.

e. Mandatory label declaration of geographic origin of the shrimp used should be provided for.

f. The order should impose a requirement setting forth the maximum time that shrimp may remain in storage prior to being coated with a batter and breading.

g. Provision should be included for optional use of alternative names for the food designated as "breaded shrimp pieces."

h. The standard should provide for the optional use of an alternative designation "breaded round fantail shrimp" for the food designated as "breaded round shrimp."

i. The standard should include a specification for the size of shrimp that may be parenthetically further designated as "prawns."

j. The method for determining the percentage of shrimp material in the finished food should not provide for the use of a rubber-tipped glass stirring rod.

The order as it relates to the above objections stands as promulgated.

2. The food designated as frozen raw lightly breaded shrimp shall contain not less than 65 percent shrimp material.

3. All safe and suitable coating ingredients are provided for optional use without specific listing in the regulation with certain exceptions. The consumer is unable to determine from a reading of the regulation what specific optional ingredients are permitted. Therefore, the label declaration of optional coating ingredients used in the preparation of the food should appear prominently and conspicuously on the principal panel or panels of the label used for display to the consumer at time of purchase.

4. The food prepared from the tail portion of shrimp from which all shell segments and tail fins are removed and wherein two or more whole shrimp, or pieces of shrimp, or both, are formed and pressed into composite units prior to coating are designated as "Breaded shrimp -----," the blank to be filled in with the words or phrase that accurately describe the shape or form, but which is not misleading. For example, if in the shape of fish sticks the food shall be designated as "Breaded shrimp sticks."

5. The percentage of shrimp material in frozen raw breaded shrimp, other than composited units, shall be calculated as follows:

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded sample}}{\text{Weight of sample}} \times 100 \pm 2$$

6. The method for determining the percentage of shrimp material in frozen raw breaded shrimp in the form of composited units shall be in accordance with the method prescribed in the United States Standards for Grades of Frozen Raw Breaded Fish Portions (50 CFR 266.-21(f)).

On the basis of the foregoing findings of fact and conclusions drawn therefrom, it is concluded that it will promote honesty and fair dealing in the interest of consumers to establish definitions and standards of identity as follows:

§ 36.30 Frozen raw breaded shrimp; identity; label statement of optional ingredients.

(a) Frozen raw breaded shrimp is the food prepared by coating one of the optional forms of shrimp specified in paragraph (c) of this section with safe and suitable batter and breading ingredients as provided in paragraph (d) of this section. The food is frozen.

(b) The food tests not less than 50 percent of shrimp material as determined by the method prescribed in paragraph (g) of this section, except that if the shrimp are composite units the method prescribed in paragraph (h) of this section is used.

(c) The term "shrimp" means the tail portion of properly prepared shrimp of commercial species. Except for composite units, each shrimp unit is individually coated. The optional forms of shrimp are:

(1) Fantail or butterfly: Prepared by splitting the shrimp; the shrimp are peeled, except that tail fins remain attached and the shell segment immediately adjacent to the tail fins may be left attached.

(2) Butterfly, tail off: Prepared by splitting the shrimp; tail fins and all shell segments are removed.

(3) Round: Round shrimp, not split; the shrimp are peeled, except that tail fins remain attached and the shell segment immediately adjacent to the tail fins may be left attached.

(4) Round, tail off: Round shrimp, not split; tail fins and all shell segments are removed.

(5) Pieces: Each unit consists of a piece or a part of a shrimp; tail fins and all shell segments are removed.

(6) Composite units: Each unit consists of two or more whole shrimp or pieces of shrimp, or both, formed and pressed into composite units prior to

coating; tail fins and all shell segments are removed; large composite units, prior to coating, may be cut into smaller units.

(d) The batter and breading ingredients referred to in paragraph (a) of this section are the fluid constituents and the solid constituents of the coating around the shrimp. These ingredients consist of suitable substances which are not food additives as defined in section 201(s) of the Federal Food, Drug, and Cosmetic Act; or if they are food additives as so defined, they are used in conformity with regulations established pursuant to section 409 of the act. Batter and breading ingredients that perform a useful function are regarded as suitable, except that artificial flavorings,

artificial sweeteners, artificial colors, and chemical preservatives, other than those provided for in this paragraph, are not suitable ingredients of frozen raw breaded shrimp. Chemical preservatives that are suitable are:

(1) Ascorbic acid, which may be used in a quantity sufficient to retard development of dark spots on the shrimp; and

(2) The antioxidant preservatives listed in § 121.101(d)(2) of this chapter that may be used to retard development of rancidity of the fat content of the food, in amounts within the limits prescribed by that section.

(e) The label shall name the food, as prepared from each of the optional forms of shrimp specified in paragraph (c) (1) to (6), inclusive, of this section, and following the numbered sequence of such subparagraph, as follows:

(1) "Breaded fantail shrimp." The word "butterfly" may be used in lieu of "fantail" in the name.

(2) "Breaded butterfly shrimp, tail off."

(3) "Breaded round shrimp."

(4) "Breaded round shrimp, tail off."

(5) "Breaded shrimp pieces."

(6) Composite units:

(i) If the composite units are in a shape similar to that of breaded fish sticks the name is "Breaded shrimp sticks"; if they are in the shape of meat cutlets, the name is "Breaded shrimp cutlets."

(ii) If prepared in a shape other than that of sticks or cutlets, the name is "Breaded shrimp -----," the blank to be filled in with the word or phrase that accurately describes the shape, but which is not misleading.

In the case of the names specified in subparagraphs (1) through (5) of this paragraph, the words in each name may be arranged in any order, provided they are so arranged as to be accurately descriptive of the food. The word "prawns" may be added in parentheses immediately after the word "shrimp" in the name of the food if the shrimp are of large size; for example, "Fantail breaded shrimp (prawns)." If the shrimp are from a single geographic area, the adjectival designation of that area may appear as part of the name; for example, "Breaded Alaskan shrimp sticks."

(f) The names of the optional ingredients used, as provided for in paragraph (d) of this section, shall be listed on the principal display panel or panels of the

label with such prominence and conspicuousness as to render them likely to be read and understood by the ordinary individual under customary conditions of purchase. If a spice that also imparts color is used, it shall be designated as "spice and coloring," unless the spice is designated by its specific name. If ascorbic acid is used to retard development of dark spots on the shrimp, it shall be designated as "Ascorbic acid added as a preservative" or "Ascorbic acid added to retard discoloration of shrimp." If any other antioxidant preservative, as provided in paragraph (c) of this section, is used, such preservative shall be designated by its common name followed by the statement "Added as a preservative."

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded sample}}{\text{Weight of sample}} \times 100 + 2$$

(g) The method for determining percentage of shrimp material for those forms specified in paragraph (c) (1) through (5) of this section is as follows:

(1) *Equipment needed.* (i) Two-gallon container, approximately 9 inches in diameter.

(ii) Two-vaned wooden paddle, each vane measuring approximately $1\frac{3}{4}$ inches by $3\frac{3}{4}$ inches.

(iii) Stirring device capable of rotating the wooden paddle at 120 r.p.m.

(iv) Balance accurate to 0.01 ounce (or 0.1 gram).

(v) U.S. Standard sieve No. 20, 12-inch diameter.¹

(vi) U.S. Standard sieve, $\frac{1}{2}$ -inch sieve opening, 12-inch diameter.¹

(vii) Forceps, blunt points.

(viii) Shallow baking pans.

(ix) Rubber-tipped glass stirring rod.

(2) *Procedure.* (i) Weigh the sample to be debreaded. Fill the container three-fourths full of water at 70° F.-80° F. Suspend the paddle in the container, leaving a clearance of at least 5 inches below the paddle vanes, and adjust speed to 120 r.p.m. Add shrimp and stir for 10 minutes. Stack the sieves, the $\frac{1}{2}$ -inch mesh over the No. 20, and pour the contents of the container onto them. Set the sieves under a faucet, preferably with spray attached, and rinse shrimp with no rubbing of flesh, being careful to

keep all rinsings over the sieves and not having the stream of water hit the shrimp on the sieve directly. Lay the shrimp out singly on the sieve as rinsed. Inspect each shrimp and use the rubber-tipped rod and the spray to remove the breading material that may remain on any of them, being careful to avoid undue pressure or rubbing, and return each shrimp to the sieve. Remove the top sieve and drain on a slope for 2 minutes, then remove the shrimp to weighing pan. Rinse contents of the No. 20 sieve onto a flat pan and collect any particles other than breading (i.e., flesh and tail fins) and add to shrimp on balance pan and weigh.

(ii) Calculate percent shrimp material:

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded shrimp sample}}{\text{Weight of sample}} \times 100$$

(h) The method for determining percentage of shrimp material for composite units, specified in paragraph (c) (6) of this section, is as follows:

(1) *Equipment needed.* (i) Water bath (for example a 3 liter to 4 liter beaker).

(ii) Balance accurate to 0.1 gram.

(iii) Clip tongs of wire, plastic, or glass.

(iv) Stop-watch or regular watch readable to a second.

(v) Paper towels.

(vi) Spatula, 4-inch blade with rounded tip.

(vii) Nut picker.

(viii) Thermometer (immersion type) accurate to $\pm 2^\circ$ F.

(ix) Copper sulfate crystals ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$).

(2) *Procedure.* (i) Weigh all composite units in the sample while they are still hard frozen.

(ii) Place each composite unit individually in a water bath that is maintained at 63° F.-86° F., and allow to remain until the breading becomes soft and can easily be removed from the still frozen shrimp material (between 10 seconds to 80 seconds for composite units held in storage at 0° F.). If the composite units were prepared using batters that are difficult to remove after one dipping, redip them for up to 5 seconds after

the initial debreading and remove residual batter materials.

[Note: Several preliminary trials may be necessary to determine the exact dip time required for "debreading" the composite units in a sample. For these trials only, a saturated solution of copper sulfate (1 pound of copper sulfate in 2 liters of tap water) is necessary. The correct dip time is the minimum time of immersion in the copper sulfate solution required before the breading can easily be scraped off: *Provided*, That the "debreaded" units are still solidly frozen and only a slight trace of blue color is visible on the surface of the "debreaded" shrimp material.]

(iii) Remove the unit from the bath; blot lightly with double thickness of paper toweling; and scrape off or pick out coating from the shrimp material with the spatula or nut picker.

(iv) Weigh all the "debreaded" shrimp material.

(v) Calculate the percentage of shrimp material in the sample, using the following formula:

§ 36.31 Frozen raw lightly breaded shrimp; identity; label statement of optional ingredients.

Frozen raw lightly breaded shrimp complies with the provisions of § 36.30, except that it contains not less than 65 percent of shrimp material, as determined by the method prescribed in § 36.30 (g) or (h), as appropriate, and that in the name prescribed the word "lightly" immediately precedes the words "breaded shrimp."

Any interested person may, within 30 days from the date of publication of this proposed order in the *FEDERAL REGISTER*, file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington, D.C., 20201, written exceptions thereto, preferably in quintuplicate. Exceptions shall point out with particularity the alleged errors in the findings of fact, conclusions, and proposed order, and shall contain specific references to the pages of the transcript of testimony or to the exhibits on which the exceptions are based. Exceptions may be accompanied by memoranda or briefs in support thereof.

Dated: December 4, 1964.

JOHN L. HARVEY,
Deputy Commissioner
of Food and Drugs.

¹ The sieves shall comply with the specifications for wire cloth and sieve frames in "Standard Specifications for Sieves," published March 1, 1940, in L.C. 584 of the U.S. Department of Commerce, National Bureau of Standards.



Department of the Interior

FISH AND WILDLIFE SERVICE

SUBSIDY APPLICATION UNDER FISHING FLEET IMPROVEMENT ACT OF 1964:

Boat Pat-San-Marie, Inc., New Bedford, Mass., has applied for a fishing vessel construction differential subsidy (under P. L. 88-498) to aid in the construction of a 100-foot overall steel vessel to engage in the fishery for scallops, groundfish, and flounders.

A hearing on the economic aspects of the application was scheduled to be held on January 25, 1965, in Washington, D. C. The U. S. Bureau of Commercial Fisheries published the notice of hearing in the December 18, 1964, Federal Register.

* * * * *

HEARING ON APPLICATION UNDER FISHING FLEET IMPROVEMENT ACT OF 1964:

Boat Ouingondy, Inc., Marion, Mass., has applied for a fishing vessel construction differential subsidy to aid in the construction of a 100-foot overall steel vessel to engage in the fishery for scallops, groundfish, and flounder.^{1/}

A hearing on the economic aspects of this application was scheduled to be held on January 28, 1965, in Washington, D. C. The U. S. Bureau of Commercial Fisheries published the notice of hearing in the December 31, 1964, Federal Register.

^{1/}The lobster fishery was added by amendment, published in the Federal Register, January 19, 1965.



Department of the Treasury

CHANGES IN ANTIDUMPING REGULATIONS ANNOUNCED:

The United States has moved to improve its procedures for determining whether certain foreign merchandise or commodities are being sold in the United States at prices lower than those charged in the exporters' home market, announced the Treasury Department on December 4, 1964.

The Treasury Department, under the Antidumping Act, must decide in specific cases whether such practices are taking place. Affirmative decisions are passed to the U. S. Tariff Commission, which must then determine that the particular American industries affected have been injured before invoking additional customs duties which are provided under the law.

In reaching its decisions as to whether the sales of imported merchandise come within the legal definition of "dumping," the Treasury has been willing to accept as "confidential" any material submitted by the parties, and the parties

in a dumping dispute have argued their positions to the Treasury privately and separately.

Henceforth, evidence submitted in confidence to help the Treasury reach a judgment will be accepted and treated as confidential only if the Treasury is itself satisfied that the nature of the material requires confidential treatment. However, even though the Treasury may not agree that the material warrants confidential treatment, the Treasury will not disclose it if the person submitting it refuses to authorize disclosure--but, in those circumstances, the information will not be given weight in support of the submitter's position.

In addition, the new regulations will: (1) Allow interested persons to argue their cases before the Treasury in each other's presence rather than separately; (2) Establish standards for determining when differences in sales volumes abroad and in the United States provide a basis for making quantity allowances in price comparisons; (3) Eliminate, in large part, the retroactive application of dumping duties. At present, such duties can be imposed on goods imported as far back as four months prior to the receipt of a complaint; (4) Allow foreign exporters to reimburse to United States importers dumping duties charged on certain shipments made to the United States.

The changes came after a thorough study by the Treasury, with the assistance of academic consultants. Amendments were proposed earlier this year after discussion of the subject at a well-attended public hearing. Following this, a large number of statements were received from domestic producers, importers, exporters, foreign governments, and various associations. The new amendments emerged from that study and broad range of comments.

The amendments as adopted were published in the Federal Register of December 5, 1964, and will go into effect 30 days after their publication. No amendment will be given retroactive effect and the provisions relating to confidentiality of information, and quantity discounts will not apply to pending cases. The amendments as published follow:

Title 19—CUSTOMS DUTIES

Chapter I—Bureau of Customs, Department of the Treasury

[T.D. 56315]

PART 14—APPRAISEMENT

Antidumping

A notice was published in the FEDERAL REGISTER on December 24, 1963 (28 F.R. 14245), stating that the Treasury Department was reviewing its regulations (19 CFR 14.6-14.13) under the Antidumping Act of 1921, as amended (19 U.S.C. 160-173). All interested parties were afforded an opportunity to be heard on January 23, 1964, with regard to the regulations.

After consideration of all written submissions received and oral arguments made at the hearing, a notice of proposed rulemaking setting forth certain proposed amendments relating to procedures under the Antidumping Act was published in the FEDERAL REGISTER on April 23, 1964 (29 F.R. 5474), pursuant to section 4 of the Administrative Procedure Act (5 U.S.C. 1003) and comments were invited to be submitted.

Due consideration now having been given to all comments, views, and other data received, the amendments as set forth below are hereby adopted. The amendments shall become effective, but not retroactively, 30 days after the date of their publication in the FEDERAL REGISTER. However, §§ 14.6a and the amendments to §§ 14.7(b) (1) and (3) and 14.9(a) shall not be effective with respect to antidumping proceedings in connection with which the question of dumping was raised or presented for the

purposes of sections 201(b) and 202(a) of the Antidumping Act, 1921, as amended (19 U.S.C. 160(b) and 161(a)), before the 30th day following the date of publication of the amendments in the FEDERAL REGISTER.

Section 14.6 is amended as follows:

1. Paragraph (b) is amended;
2. Paragraph (c) is amended;
3. Paragraph (d) (1) is amended;
4. Paragraph (e) is amended.

The amended paragraphs read as follows:

§ 14.6 Suspected dumping.

(b) Any person outside the Customs Service who has information that merchandise is being, or is likely to be, imported into the United States under such circumstances as to bring it within the purview of the Antidumping Act, 1921, as amended,¹⁴ may communicate such information in writing to the Commissioner of Customs. Every such communication shall contain or be accompanied by the following:

(1) A detailed description or sample of the merchandise; the name of the country from which it is being, or is likely to be, imported; the name of the exporter or exporters and producer or producers, if known; and the ports or probable ports of importation into the United States. If no sample is furnished, the Bureau of Customs may call upon the person who furnished the information to furnish samples of the imported and competitive domestic articles, or either.

(2) Such detailed data as are reasonably available with respect to values and prices indicating that such merchandise is being, or is likely to be, sold in the United States at less than its fair value, within the meaning of the Antidumping Act, 1921, as amended, including information as to any differences between the foreign market value or constructed value and the purchase price or exporter's sales price which may be accounted for by any difference in taxes, discounts, incidental costs such as those for packing or freight, or other items.

(3) Such information as is reasonably available to the person furnishing the information as to the total value and volume of domestic production of the merchandise in question.

(4) Such suggestions as the person furnishing the information may have as to specific avenues of investigation to be pursued or questions to be asked in seeking pertinent information.

(c) If any information filed pursuant to paragraph (b) of this section does not conform with the requirements of that paragraph, the Commissioner shall return the communication to the person who submitted it with detailed written advice as to the respects in which it does not conform.

(d) (1) Upon receipt pursuant to paragraph (a) or (b) of this section of information in proper form:

(i) The Commissioner shall conduct a summary investigation. If he determines that the information is patently in error or that the merchandise is not being and is not likely to be imported in more than insignificant quantities he shall so advise the person who submitted the information and the case shall be closed. Otherwise, the Commissioner shall publish a notice in the FEDERAL REGISTER that information in proper form has been received pursuant to paragraph (a) or (b)

of this section. This notice, which may be referred to as the "Antidumping Proceeding Notice," will specify whether the information relates to all shipments of the merchandise in question from an exporting country, or only to shipments by certain persons or firms; in the latter case, only the names of such persons and firms will be specified. The notice shall also specify the date on which information in proper form was received and that date shall be the date on which the question of dumping was raised or presented for purposes of sections 201(b) and 202(a) of the Antidumping Act, 1921, as amended (19 U.S.C. 160(b) and 161(a)). The notice shall also contain a summary of the information received. If a person outside the Customs Service raised or presented the question of dumping, his name shall be included in the notice unless a determination under § 14.6a of the regulations of this part requires that his name not be disclosed.

(ii) The Commissioner shall thereupon proceed promptly to decide whether or not reasonable grounds exist to believe or suspect that the merchandise is being, or likely to be, sold at less than its foreign market value (or, in the absence of such value, than its constructed value). To assist him in making this decision the Commissioner, in his discretion, may conduct a brief preliminary investigation into such matters, in addition to the invoice or other papers or information presented to him, as he may deem necessary.

(e) If the Commissioner determines pursuant to paragraph (d) (1) (ii) of this section, or in the course of an investigation under paragraph (d) (3) (i) of this section, that there are reasonable grounds to believe or suspect that any merchandise is being, or is likely to be, sold at less than its foreign market value (or, in the absence of such value, than its constructed value) under the Antidumping Act, he shall publish notice of that fact in the FEDERAL REGISTER, furnishing an adequate description of the merchandise, the name of each country of exportation, and the date of the receipt of the information in proper form, and shall advise all appraisers of his action. This notice may be referred to as the "Withholding of Appraisement Notice." If the belief or suspicion relates only to certain shippers or producers, the notice shall specify that this is the case and that the investigation is limited to the transactions of such shippers or producers. The notice shall also specify whether the appropriate basis of comparison for fair value purposes is purchase price or exporter's sales price if sufficient information is available to so state; otherwise a supplementary notice will be published in the FEDERAL REGISTER as soon as possible which will specify which of such prices is the appropriate basis of comparison for fair value purposes. Upon receipt of such advice, the appraisers shall proceed to withhold appraisement in accordance with the pertinent provisions of § 14.9.

(Secs. 201, 407, 42 Stat. 11, as amended, 18; 19 U.S.C. 160, 173)

Part 14 is amended by deleting present footnote 14; by redesignating present footnote 14a as footnote 14.

Part 14 is amended further by adding a new section designated 14.6a reading as follows:

§ 14.6a Disclosure of information in antidumping proceedings.

(a) *Information generally available.*

In general, all information, but not necessarily all documents, obtained by the Treasury Department, including the Bureau of Customs, in connection with any antidumping proceeding will be available for inspection or copying by any interested person, such as the producer of the merchandise, any importer, exporter, or domestic producer of merchandise similar to that which is the subject of the proceeding. With respect to documents prepared by an officer or employee of the United States, factual material, as distinguished from recommendations and evaluations, contained in any such document will be made available by summary or otherwise on the same basis as information contained in other documents. Attention is directed to § 24.12 of this chapter relating to fees charged for providing copies of documents.

(b) *Requests for confidential treatment of information.* Any person who submits information in connection with an antidumping proceeding may request that such information, or any specified part thereof, be held confidential. Information covered by such a request shall be set forth on separate pages from other information; and all such pages shall be clearly marked "Confidential Treatment Requested." The Commissioner of Customs or the Secretary of the Treasury or the delegate of either will determine, pursuant to paragraph (c) of this section, whether such information, or any part thereof, shall be treated as confidential. If it is so determined, the information covered by the determination will not be made available for inspection or copying by any person other than an officer or employee of the United States Government or a person who has been specifically authorized to receive it by the person requesting confidential treatment. If it is determined that information submitted with such a request, or any part thereof, should not be treated as confidential, or that summarized or approximated presentations thereof should be made available for disclosure, the person who has requested confidential treatment thereof shall be promptly so advised and, unless he thereafter agrees that the information, or any specified part or summary or approximated presentations thereof, may be disclosed to all interested parties, the information will not be made available for disclosure, but to the extent that it is self-serving it will be disregarded for the purpose of the determination as to sales below fair value and no reliance shall be placed thereon in this connection.

(c) *Standards for determining whether information will be regarded as confidential.* (1) Information will ordinarily be considered to be confidential only if its disclosure would be of significant competitive advantage to a competitor or would have a significantly adverse effect upon a person supplying the information or upon a person from whom he acquired the information. Further, if disclosure of information in specific terms or with identifying details would be inappropriate under this standard,

the information will ordinarily be considered appropriate for disclosure in generalized, summary or approximated form, without identifying details, unless the Commissioner of Customs or the Secretary of the Treasury or the delegate of either determines that even in such generalized, summary or approximated form, such disclosure would still be of significant competitive advantage to a competitor or would still have a significantly adverse effect upon a person supplying the information or upon a person from whom he acquired the information. As indicated in paragraph (b) of this section, however, the decision that information is not entitled to protection from disclosure in its original or in another form will not lead to its disclosure unless the person supplying it consents to such disclosure.

(2) Information will ordinarily be regarded as appropriate for disclosure if it

(i) Relates to price information;
(ii) Relates to claimed freely available price allowances for quantity purchases; or

(iii) Relates to claimed differences in circumstances of sale.

(3) Information will ordinarily be regarded as confidential if its disclosure would

(i) Disclose business or trade secrets;
(ii) Disclose production costs;
(iii) Disclose distribution costs, except to the extent that such costs are accepted as justifying allowances for quantity or differences in circumstances of sale;

(iv) Disclose the names of particular customers or the price or prices at which particular sales were made.

(Sec. 407, 42 Stat. 18; 19 U.S.C. 173.)

Section 14.7(b) is amended as follows:

1. Subparagraph (1) is amended;
2. Subparagraph (3) is amended;
3. Subparagraph (4) is amended;
4. A new subparagraph (9) is added.

The amended and added subparagraphs of § 14.7(b) read as follows:

§ 14.7 Fair value.

(b) *Calculations of fair value.* * * *

(1) *Quantities.* In comparing the purchase price or exporter's sales price, as the case may be, with such applicable criteria as sales or offers, on which a determination of fair value is to be based, reasonable allowances will be made for differences in quantities if it is established to the satisfaction of the Secretary that the amount of any price differential is wholly or partly due to such differences. In determining the question of allowances for differences in quantity, consideration will be given, among other things, to the practice of the industry in the country of exportation with respect to affording in the home market (or third country markets, where sales to third countries are the basis for comparison) discounts for quantity sales which are freely available to those who purchase in the ordinary course of trade. Allowances for price discounts based on sales in large quantities ordinarily will not be made unless (i) the exporter during the six months prior to the date when the question of dumping was raised or presented had been granting quantity discounts of at least the same magnitude with respect to 20 percent or more of

such or similar merchandise which he sold in the home market (or in third country markets when sales to third countries are the basis for comparison) and that such discounts had been freely available to all purchasers, or (ii) the exporter can demonstrate that the discounts are warranted on the basis of savings specifically attributable to the quantities involved.

(3) *Similar merchandise.* In comparing the purchase price or exporter's sales price, as the case may be, with the selling price in the home market, or for exportation to countries other than the United States, in the case of similar merchandise described in subdivisions (C), (D), (E), or (F) of section 212(3), Anti-dumping Act, 1921, as amended (19 U.S.C. 170a(3)), due allowance shall be made for differences in the merchandise. In this regard the Secretary will be guided primarily by the effect of such differences upon the market value of the merchandise but, when appropriate, he may also consider differences in cost of manufacture if it is established to his satisfaction that the amount of any price differential is wholly or partly due to such differences.

(4) *Offering price.* In the determination of fair value, offers will be considered in the absence of sales, but an offer made in circumstances in which acceptance is not reasonably to be expected will not be deemed to be an offer.

(9) *Revision of prices or other changed circumstances.* Whenever the Secretary of the Treasury is satisfied that promptly after the commencement of an antidumping investigation either

(i) price revisions have been made which eliminate the likelihood of sales below fair value and that there is no likelihood of resumption of the prices which prevailed before such revision, or (ii) sales to the United States of the merchandise have terminated and will not be resumed; or whenever the Secretary concludes that there are other changed circumstances on the basis of which it may no longer be appropriate to continue an antidumping investigation, the Secretary shall publish a notice to this effect in the FEDERAL REGISTER. The notice shall state the facts relied on by the Secretary in publishing the notice and that those facts are considered to be evidence that there are not and are not likely to be sales below fair value. The notice shall also state that unless persuasive evidence or argument to the contrary is presented within 30 days the Secretary will determine that there are not and are not likely to be sales below fair value.

(Sec. 407, 42 Stat. 18; 19 U.S.C. 173.)

Part 14 is amended further by amending examples 4 and 5 under "Examples for Purposes of Illustration" in footnote 15 to read:

Example 4. A foreign producer makes all of his sales, other than those to the United States, for consumption in the country of exportation. The majority of the merchandise thus sold by him is sold in 50-ton lots at list prices, net. However, a discount of 5 percent is granted on sales of more than 500 tons and is freely available to those who purchase in the ordinary course of trade. During the six months preceding the date when the question of dumping was raised, the producer made sales of more than 500

tons each with respect to 15 percent of such or similar merchandise which he sold in the home market. Sales for exportation to the United States are at list prices less 5 percent and have been in quantities of over 500 tons. The 5 percent will not be allowed as a quantity discount because less than 20 percent of such or similar merchandise was sold in the home market in quantities to which such discount was applicable, unless the 5 percent discount can be justified by cost savings. Cost savings can also be used to justify a quantity discount where there were no sales in the home market in quantities sufficient to warrant the granting of the 5 percent discount, and no offers because there is no potential market for such quantities.

In determining whether a discount has been given, the presence or absence of a published price list reflecting such a discount is not controlling. In certain lines of trade, price lists are not commonly published and in others although commonly published they are not commonly adhered to.

The following example also relates to quantity allowances.

Example 5. A foreign producer has the following record of sales at or about the date of sale or exportation to the United States:

Price per lb. for sales in units of 100 lbs. and 1,000 lbs.	Sales for consumption in country of exportation	Sales to the United States
\$0.85 (100 lbs.).....	200,000 lbs.....	100,000 lbs.....
\$0.80 (1,000 lbs.).....	20,000 lbs.....	10,000 lbs.....

Although the lower price in the home market appears to obtain for quantities the same as those sold for exportation to the United States at the same price, the quantity sold for home consumption at the lower price is less than 20 percent of the quantity sold in the home market. Accordingly, the price for exportation to the United States is not justified, unless cost savings can be shown to justify the lower price. If 44,000 pounds had been sold in the home market at the \$0.80 price, the lower price would have been justified for comparison with the price for exportation to the United States.

Section 14.8(a) is amended to read:

§ 14.8 Determination of fact or likelihood of sales at less than fair value; determination of injury; finding of dumping.

(a) Upon receipt from the Commissioner of Customs of the information referred to in § 14.6(d), the Secretary of the Treasury will proceed as promptly as possible to determine tentatively whether or not the merchandise in question is in fact being, or is likely to be, sold in the United States or elsewhere at less than its fair value. As soon as possible the Secretary will publish in the FEDERAL REGISTER a "Notice of Tentative Determination," which will include a statement of the reasons on which the tentative determination is based. Interested persons will be given an opportunity to make such written submissions as they desire, within a period which will be specified in the notice, with respect to the contemplated action. Appropriate consideration will be given to any new or additional information or argument submitted. If any person believes that any information obtained by the Bureau of Customs in the course of an antidumping proceeding is inaccurate or that for any other reason the tentative determination is in error, he may request in writing that the Secretary of the Treasury afford him an opportunity to present his views in this regard. Upon receipt of such a request the Secretary will notify the person who supplied any information, the accuracy of which is questioned

and such other person or persons, if any, as he in his discretion may deem to be appropriate. If the Secretary is satisfied that the circumstances so warrant, an opportunity will be afforded by the Secretary or his delegate for all such persons to appear, through their counsel or in person, accompanied by counsel if they so desire, to make known their respective points of view and to supply such further information or argument as may be of assistance in leading to a conclusion as to the accuracy of the information in question. The Secretary or his delegate may at any time, upon appropriate notice, invite any such person or persons as he in his discretion may deem to be appropriate to supply him orally with information or argument. As soon as possible thereafter, the Secretary will make a final determination, except that the Secretary may defer making an affirmative determination of sales below fair value during the pendency of any other antidumping proceeding which relates to the same class or kind of merchandise imported from another foreign country. The Secretary will defer making an affirmative determination only if he is satisfied that deferral is appropriate under all of the circumstances. Circumstances which the Secretary will take into consideration will include the dates on which information relating to the various antidumping proceedings came to his attention, the volume of sales involved in each proceeding, elements of hardship, if any, and probable extent of delay which deferral would entail. No determination that sales are not below fair value will be deferred because of this provision. Whenever the Secretary makes a deter-

mination of sales at less than fair value he will so advise the United States Tariff Commission.

(Secs. 201, 407, 42 Stat. 11, as amended, 18; 19 U.S.C. 160, 173)

Section 14.9 is amended as follows:

1. Paragraph (a) is amended;

2. Paragraph (f) is amended.

The amended paragraphs of § 14.9 read as follows:

§ 14.9 Action by the appraiser.

(a) Upon receipt of advice from the Commissioner of Customs pursuant to § 14.6(e), if the Commissioner's "Withholding of Appraisal Notice" shall specify that the proper basis of comparison for fair value purposes is exporter's sales price or if that notice does not specify the appropriate basis of comparison for fair value purposes, each appraiser shall withhold appraisal as to such merchandise entered, or withdrawn from warehouse, for consumption, on any date after the 120th day before the question of dumping was raised by or presented to the Secretary of the Treasury or his delegate. If the Commissioner's "Withholding of Appraisal Notice," including any supplementary notice, shall specify that the proper basis of comparison for fair value purposes is purchase price, the appraiser shall withhold appraisal as to such merchandise entered, or withdrawn from warehouse, for consumption, after the date of publication of the "Withholding of Appraisal Notice." Each appraiser shall notify the collector and importer immediately of each lot of merchandise with respect to which appraisal is so withheld. Upon advice of a

finding made in accordance with § 14.8 (b), the appraiser shall give immediate notice thereof to the collector and the importer when any shipment subject thereto is imported after the date of the finding and information is not on hand for completion of appraisal of such shipment. Customs Form 6459 shall be used to notify the collector and importer whenever appraisal is withheld under this paragraph.

(f) In calculating purchase price or exporter's sales price, as the case may be, there shall be deducted the amount of any special dumping duties which are, or will be, paid by the manufacturer, producer, seller, or exporter, or which are, or will be, refunded to the importer by the manufacturer, producer, seller, or exporter, either directly or indirectly, but a warranty of nonapplicability of dumping duties granted to an importer with respect to merchandise which is (1) purchased, or agreed to be purchased, before publication of a "Withholding of Appraisal Notice" with respect to such merchandise and (2) exported before a determination of sales below fair value is made, will not be regarded as affecting purchase price or exporter's sales price.

(Secs. 201, 202, 203, 204, 208, 407, 42 Stat. 11, as amended, 12, 13, 14, 18, sec. 486, 46 Stat. 725, as amended; 19 U.S.C. 160, 161, 162, 163, 167, 173, 1486)

[SEAL] LESTER D. JOHNSON,
Acting Commissioner of Customs.

Approved: November 25, 1964.

JAMES A. REED,
Assistant Secretary of the
Treasury.

BUREAU OF CUSTOMS

**RULING ON FOREIGN FISHERY
LANDINGS IN U. S. PORTS:**

While foreign-flag vessels may not fish in territorial waters of the United States nor land in the United States fish taken aboard on the high seas, there is no prohibition against such vessels landing fish taken aboard in the territorial waters or a port of a foreign country, the U. S. Bureau of Customs has ruled.

In reply to an inquiry from a collector of customs as to whether a Canadian vessel may land its catch of fish taken in Canadian territorial waters, and whether such waters may be deemed to extend beyond the 3-mile limit, the Acting Commissioner of Customs cited Section 251, title 46, U. S. Code, and stated:

"Neither that law nor any other, so far as the Bureau is aware, prohibits a foreign-flag vessel from landing in a port of the United States fish taken on board anywhere other than on the high seas or in territorial waters of the United States. This being so, as a matter of law, there is no reason why a Canadian

fishing vessel may not land in the United States its catch of fish taken in Canadian territorial waters. Of course, in such case, the place where the fish were taken or laden must be established to the satisfaction of the collector of customs concerned.

"The Department of State has advised the Bureau that, even though Canada has recently claimed exclusive fisheries rights in waters up to a limit of 12 miles from the baseline from which the territorial sea is measured, the limits of the territorial waters themselves have not been extended, and that as a consequence waters outside the 3-mile limit are regarded as waters of the high seas.

"Accordingly, fish taken by Canadian vessels in the area beyond the 3-mile limit, including those taken in the area from 3 miles to 12 miles from the Canadian coast, will be deemed to have been taken on the high seas for the purpose of Section 251 and may not be landed in the United States by the taking vessels or by other vessels to which the catch may have been transferred in such waters."

The Bureau's answer to the collector in no way concerned the question of foreign vessels fishing in the United States territorial waters and may not be construed as authorizing them to do so. On the contrary, foreign vessels are prohibited from fishing in United States waters by Section 251, title 46, United States Code, and by Public Law 88-308, approved May 20, 1964.

It should be pointed out that the answer given conforms to the position taken by the Bureau in previous similar rulings, the first made a short time after the amendment of September 2, 1950, of the act upon which Section 251 as cited above is based. It is thus not a new or different interpretation of the law but merely a restatement of interpretations of long standing. (U. S. Bureau of Customs, December 23, 1964.)



White House

NEW INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA:

The Regulations for Preventing Collisions at Sea, 1960, were proclaimed by the President, December 29, 1964, to become effective September 1, 1965, under the Act of September 24, 1963 (P. L. 88-131). The new regulations (commonly called the 1960 International Rules of the Road) apply to all public and private vessels and aircraft of United States registry covered by the legislation. The new International Rules will not be effective, however, on United States waters governed by Inland, Great Lakes, or Western Rivers Rules of the Road. (Federal Register, December 31, 1964.)

Note: See Commercial Fisheries Review, Jan. 1965 p. 103.



Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legisla-

tive actions by the House and Senate, as well as signature into law or other final disposition are covered.

CONGRESS CONVENES: The first session of the 89th Congress convened Jan. 4, 1965, and heard the President's State of the Union message. The message was referred to Committee of the Whole House on the State of the Union and ordered printed as a House document (H. Doc. 1). At one point in his message the President said, "We will seek legal power to prevent pollution of our air and water before it happens. We will step up our effort to control harmful wastes, giving first priority to the cleanup of our most contaminated rivers. We will increase research to learn much more about the control of pollution."

ANADROMOUS FISH CONSERVATION: Introduced in House, H. R. 23 (Dingell), H. R. 24 (Keith), and H. R. 300 (Johnson of Calif.), Jan. 4, 1965; to authorize the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with the several states; to Committee on Merchant Marine and Fisheries. Purpose is to carry out a positive and comprehensive program of conserving and developing the Nation's anadromous fishery resources that are subject to depletion from Federal, state, and private water-resource developments and for other causes, or with respect to which this country has international commitments. Species of anadromous fish covered; such as salmon (which spawn in fresh water but live much of their lives in the sea), steelhead trout, shad, and striped bass. Would provide up to \$25 million for the period ending June 30, 1969. No state would receive more than 20 percent of total funds; would require a 50 percent cost-sharing ratio between the Federal and a state government; pollution of estuarine areas are to be reported to proper authorities for appropriate action. (These bills are similar to several other bills, especially H. R. 2392 in 88th Congress, which was passed by the House Sept. 1, 1964; sent to Senate, referred to Committee on Commerce Sept. 2, 1964; no action by Senate.)

ANTIDUMPING ACT AMENDMENT: Introduced in House Jan. 4, 1965; H. R. 301 (Dent), H. R. 979 (Conte), H. R. 1165 (Secrest); Jan. 6: H. R. 1674 (Curtin), H. R. 1715 (Morgan); Jan. 7: H. R. 2094 (Whalley); to amend the Antidumping Act, 1921; to Committee on Ways and Means. Would provide for greater certainty, speed, and efficiency in the enforcement and certain changes in wording of the Act. (Similar to numerous bills in 88th Congress; no action.)

BUREAU OF COMMERCIAL FISHERIES REPORT: Senate received Jan. 6, 1965, a letter from the Secretary of the Interior, transmitting, pursuant to law, a report of operations of the Bureau of Commercial Fisheries, for the fiscal year ended June 30, 1963 (with accompanying report); to the Committee on Commerce. Also, House received Jan. 4, 1965, a letter from the Secretary of the Interior; transmitting the Ninth Annual Report of the Secretary on Operations of the Bureau of Commercial Fisheries conducted under the Saltonstall-Kennedy Act, pursuant to 68 Stat. 376, as amended; to the Committee on Merchant Marine and Fisheries.

COMMERCIAL FISHERIES ADVANCEMENT FUND: H. R. 841 (Multer) introduced in House Jan. 4, 1965, to amend the act of Aug. 11, 1939, relating to domesti-

cally produced fishery products to establish a fund for the advancement of commercial fisheries; to Committee on Merchant Marine and Fisheries. (Seems to be similar to P. L. 88-309 enacted by the 88th Congress and signed by the President May 20, 1964; cited as Commercial Fisheries Research and Development Act, also known as Federal Aid for State Commercial Fisheries and Development.)

COMMODITY PACKAGING AND LABELING: Introduced in House, H. R. 643 (Multer), H. R. 770 (Gilbert), and H. R. 993 (Farbstein) Jan. 4, 1965; H. R. 1664 (Celler) Jan. 6, 1965; to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce and for other purposes; to the Committee on the Judiciary. Would direct the Food and Drug Administration (for foods, drugs, and cosmetics) and the Federal Trade Commission (for other consumer commodities) to promulgate regulations that will require packages accurately and clearly to give essential product information and fairly represent the contents. (Similar to several bills in 88th Congress; no action.)

FISH HATCHERIES: Senate Jan. 6, 1965, received a letter from the Comptroller General of the United States, transmitting, pursuant to law, a report on weaknesses in administration of the national fish hatchery program, Bureau of Sports Fisheries and Wildlife, U.S. Fish and Wildlife Service, Department of the Interior, dated Oct. 1964 (with an accompanying report); to the Committee on Government Operations.

IMPORT COMMODITY LABELING: H. R. 467 (Herlong) introduced in House Jan. 4, 1965, to amend the Tariff Act of 1930 to require certain new packages of imported articles to be marked to indicate the country of origin, and for other purposes; to the Committee on Ways and Means. (Similar to H. R. 2513 passed by the 88th Congress and sent to President for signature after Senate agreed to conference report on Dec. 18, 1963. President pocket vetoed the bill by allowing it to expire on Dec. 31, 1963.)

S. 88 (McGee and Simpson) introduced in Senate Jan. 6, 1965, to amend the Federal Food, Drug, and Cosmetic Act, as amended to require the labeling of certain imported meats, poultry, and fish; to the Committee on Labor and Public Welfare; similar to H. R. 467. (Similar to several bills in 88th Congress; no action.)

METRIC SYSTEM STUDY: H. R. 38 (McClory) introduced in House Jan. 4, 1965, to provide that the National Bureau of Standards shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the metric system of weights and measures; to Committee on Science and Astronautics. (Similar to several bills in 88th Congress; no action.)

OCEANOGRAPHIC AGENCY OR COUNCIL: H. R. 921 (Wilson of Calif.) introduced in House Jan. 4, 1965, to establish the National Oceanographic Agency; to the Committee on Merchant Marine and Fisheries. Would set up a coordinating Federal Agency for oceanography that would help give direction and force to the many experiments and studies already under way, and establish goals and make assignments toward them. Congressman Wilson inserted remarks on this bill in the Congressional Record, Jan. 4, 1965. (Similar to bills in 88th Congress; no action.)

OFFSHORE FISHERY RESOURCES CONSERVATION: S. 49 (Gruening for himself, Muskie and Pastore) introduced in Senate Jan. 6, 1965, to conserve the offshore fishery resources of the United States and its territories, and for other purposes; to the Committee on Interior and Insular Affairs. Congressional Record, Jan. 7, 1965, contained remarks on this bill by Senator Gruening. In part, he stated: "The bill was designed to conserve the offshore fishery resources of the United States to authorize the extension of the territorial waters of our Nation and its territories to 12 miles." He also stated that the need persists to extend our territorial waters and give our fishermen a wider area in which to fish unmolested by foreign competition. "Today," he said, "49 nations have extended their territorial waters to 12 miles or more at the same time foreign vessels are fishing off our shores in ever-increasing numbers . . ." He pointed out that the following countries, as of December 1, 1964, according to information supplied by the Library of Congress, Legislative Reference Service, claim territorial limits or zones for special purposes, including fishing, which extend to at least 12 miles from the coasts: Albania, Algeria, Brazil, Bulgaria, Byelorussian S.S.R., Cambodia, Canada, Ceylon, Chile, Communist China, Colombia, Costa Rica, Cyprus, Dominican Republic, Ecuador, El Salvador, Ethiopia, Ghana, Guatemala, Guinea, Iceland, India, Indonesia, Iran, Republic of Korea, Libya, Malagasy Republic, Morocco, Norway, Panama, Peru, Rumania, Saudi Arabia, Senegal, South Africa, Sudan, Syria, Tanzania, Thailand, Togo, Tunisia, Turkey, Ukrainian S.S.R., U.S.S.R., United Arab Republic, United Kingdom, Uruguay, Venezuela, Vietnam (South). It is expected that the following nations will shortly ratify the European Fishery Convention of 1964 which claims a 3 mile territorial sea plus 3 miles exclusive fishing zone plus 6 additional miles which is restricted to nations party to the convention: Denmark, France, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden. So the total may climb to 58 countries claiming jurisdiction over at least 12 miles of territorial sea for fishing purposes. He also stated that we have given in grants the sum of \$14,693,024 since 1955 to build up the fisheries of other nations. That total includes \$5,351,000 to help the fishermen of Korea, \$1,355,670 to assist the fishermen of Pakistan, and \$907,198 to assist the fishermen of Indonesia. Senator Gruening's remarks were followed by a reprint of his speech, "Our Fisheries Need Greater and Firmer Support and a 12-Mile Limit" given at the 16th Annual Session of the Gulf and Caribbean Fisheries Institute, Miami, Fla., Nov. 11, 1963. (Similar to S. 1816 in 88th Congress; no action.)

OUTER CONTINENTAL SHELF RESTRICTED AREAS: Senate Jan. 7, 1965, received 3 letters from the Secretary of the Air Force, transmitting drafts of proposed legislation to provide for the restriction of certain areas in the outer Continental Shelf for defense purposes--(1) the Eastern Test Range, (2) Gulf Test Range, Gulf of Mexico, (3) Matagorda Water Range; and for other purposes (with accompanying papers); to the Committee on Interior and Insular Affairs.

PACIFIC SOUTHWEST WATER RESOURCES: H. R. 313 (Hosmer) introduced in House Jan. 4, 1965, to authorize the coordinated development of the water resources of the Pacific Southwest, and for other purposes; to Committee on Interior and Insular Affairs. Also S. 294 (Kuchel) introduced in Senate Jan. 6, 1965.

PRICE DISCRIMINATION PRACTICES: H. R. 601 (Multer) introduced in House Jan. 4, 1965, to amend the

Federal Trade Commission Act to strengthen independent competitive enterprise by providing for fair competitive acts, practices, and methods of competition, and for other purposes. Principally would prevent price discrimination or selling at unreasonably low prices. (Similar to several bills in 88th Congress; no action.)

SCIENCE AND TECHNOLOGY COMMISSION: H. R. 15 (Teague of Texas) introduced in House Jan. 4, 1965, for the establishment of a Commission on Science and Technology; to Committee on Science and Astronautics. Commission would be composed of representatives from the legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. Would provide for a study of all of the programs, methods and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs, with objective of bringing about more economy and efficiency in the performance of these essential activities and functions. (Similar to S. 816 in 88th Congress; passed Senate Mar. 8, 1963; received by House Mar. 11, 1963, but no further action.)

TRADE EXPANSION ACT AMENDMENT: Introduced in House H. R. 656 (Pucinski) and H. R. 1166 (Secrest) Jan. 4, 1965; H. R. 2096 (Whalley) Jan. 7, 1965; to amend the Trade Expansion Act of 1962 to provide judicial review of certain determinations of the Tariff Commission and for other purposes; to the Committee on Ways and Means.

VESSEL JANICE VEE: H. R. 2137 (Gibbons) private bill, introduced in House Jan. 7, 1965, to permit the vessel Janice Vee to be documented for use in the fisheries and coastwise trade; to the Committee on Merchant Marine and Fisheries.

WATER POLLUTION CONTROL ACT: H. R. 982 (Dingell) introduced in House Jan. 4, 1965, to amend the Federal Water Pollution Control Act, as amended, and the Clean Air Act, as amended, to provide for improved cooperation by Federal agencies to control water and air pollution from Federal installations and facilities and to control automotive vehicle air pollution; to the Committee on Public Works.

WATER POLLUTION CONTROL ADMINISTRATION: introduced in House, Jan. 4, 1965: H. R. 151 (Rodino), H. R. 983 (Dingell); Jan. 7, H. R. 2064 (Madden); to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, to increase grants for construction of municipal sewage treatment works, to authorize the issuance of regulations to aid in preventing, controlling, and abating pollution of interstate waters, and for other purposes; to the Committee on Public Works. Also S. 4 (Muskie for himself and 25 other Senators)

introduced in Senate Jan. 6, 1965, similar to H. R. 151. (Similar to several bills in 88th Congress, especially S. 649 passed by Senate Oct. 13, 1963, and reported favorably by House Committee on Public Works Sept. 3, 1964; no further action.)

WATER PROJECT RECREATION ACT: H. R. 52 (Aspinall) introduced in House Jan. 4, 1965, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water projects, and to provide the Secretary of the Interior with authority for recreation development of projects under his control; to Committee on Interior and Insular Affairs.

WATER RESOURCES PLANNING ACT: S. 22 (Anderson for himself and 5 other Senators) introduced in Senate Jan. 6, 1965, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commission, and by providing financial assistance to the states in order to increase state participation in such planning; to the Committee on Interior and Insular Affairs. Also H. R. 1111 (Aspinall) introduced in House Jan. 4, 1965. (Similar to several bills in 88th Congress, especially S. 1111 passed by Senate Dec. 4, 1963; House Committee on Interior and Insular Affairs favorably reported bill to House Sept. 2, but no further action.)

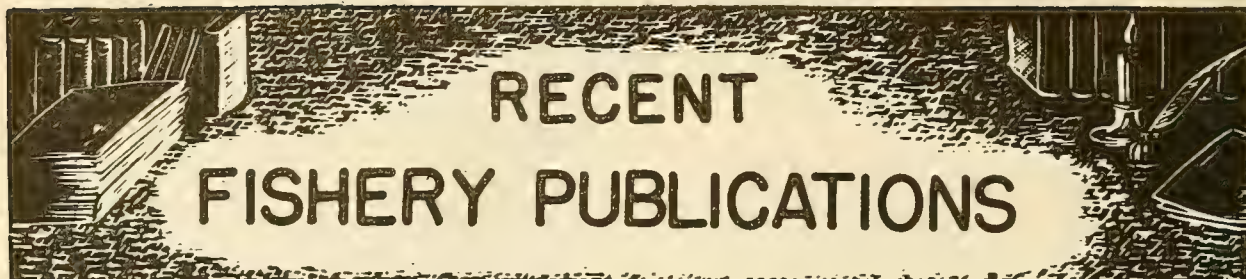
WATER RESOURCES RESEARCH: S. 267 (Anderson for himself and 16 other Senators) introduced Jan. 6, 1965, to promote a more adequate national program of water research; to the Committee on Interior and Insular Affairs.

Eighty-Eighth Congress (Second Session)

METRIC SYSTEM STUDY: Conversion to Metric System, Hearing before the Committee on Commerce, United States Senate, 88th Congress, 2nd session, on S. 1278, a bill to provide that the National Bureau of Standards shall conduct a program of investigation, research, and survey to determine the practicability of the adoption by the United States of the Metric System of Weights and Measures, Jan. 7, 1964, Serial 64, 71 pp., printed. Includes comments, statements and miscellaneous letters, resolutions, etc. of various Federal agencies, and representatives of various associations and business firms, and individuals.

Note: **REPORT ON FISHERY ACTIONS IN 87TH AND 88TH CONGRESS:** The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 No. Fort Myer Drive, Room 510, Arlington, Va. 22209. A few copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 87th Congress, 1st Session 1961 and 2nd Session 1962," are also available upon request. Requests for these leaflets will be filled on a first-come first-served basis until the supply is exhausted.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3602	- Florida Landings, 1963 Annual Summary, 15 pp.
CFS-3608	- Michigan, Ohio & Wisconsin Landings, June 1964, 6 pp.
CFS-3624	- Great Lakes Fisheries, 1963 Annual Summary, 9 pp.
CFS-3640	- Frozen Fishery Products, September 1964, 8 pp.
CFS-3646	- New Jersey Landings, August 1964, 3 pp.
CFS-3648	- Rhode Island Landings, June 1964, 3 pp.
CFS-3650	- New York Landings, August 1964, 5 pp.
CFS-3651	- Virginia Landings, July 1964, 4 pp.
CFS-3654	- Alabama Landings, August 1964, 3 pp.
CFS-3655	- Louisiana Landings, August 1964, 3 pp.
CFS-3660	- Virginia Landings, August 1964, 4 pp.
CFS-3665	- Maine Landings, August 1964, 4 pp.
CFS-3668	- Mississippi Landings, July 1964, 3 pp.
CFS-3669	- Florida Landings, September 1964, 8 pp.
CFS-3672	- Fish Meal and Oil, September 1964, 2 pp.

Sep. No. 722 - Review of Industrial Bottomfish Fishery in Northern Gulf of Mexico, 1959-62.

Sep. No. 723 - Summary of Tuna Observations in the Gulf of Mexico on Cruises of the Exploratory Fishing Vessel Oregon, 1950-63.

Sep. No. 724 - Equipment Note No. 15 - Airlift for Harvesting Oysters.

Sep. No. 725 - Salmon Research Cruise in Western North Pacific.

SSR-Fish. No. 456 - Ecological Studies of Sockeye Salmon and Related Limnological and Climatological Investigations, Brooks Lake, Alaska, 1957, by Theodore R. Merrel, Jr., 69 pp., illus., July 1964.

Operations of the Bureau of Commercial Fisheries under the Saltonstall-Kennedy Act, Fiscal Year 1963, 118 pp., illus., August 1964. The ninth annual

report to the Congress of the activities of the U. S. Bureau of Commercial Fisheries during the fiscal year ending June 30, 1963, under the provisions of the Saltonstall-Kennedy Act of July 1, 1954. Discusses commercial fishery progress in nationwide programs in technology, market news reporting, statistical reporting, marketing, biological and oceanographic research, foreign trade, and economics. In the Pacific Region, emphasis was placed on the increasing threat to salmon from multiple purpose dams, the fresh halibut grading program, improving the quality of fresh halibut, quality studies of Dungeness crab, measuring changes in fish quality, marketing and home economics activities, and increased market news coverage of Alaska halibut and troll salmon fisheries. The Gulf and South Atlantic Region worked on brown and pink shrimp research, shrimp behavior studies, environmental studies, trawl experiments, biological studies of Atlantic menhaden, striped bass research program, studies on oysters and clams, seasonal sampling of scallop beds, mullet utilization, and product quality control. In the North Atlantic Region, activity centered around oceanographic studies; tagging studies; haddock and scallop abundance; the Atlantic Herring Preremitt Program; FY 1963; oyster drill study; shellfish ecology; oyster setting in local waters; drill control used by oystermen; survival and growth of juvenile oysters; culture of bivalve food; fish protein supplement; fishing gear research; pelagic trawling; electrical trawling; Maine sardine promotion; and vessel safety program. Great Lakes and Central Region programs included environmental research in Lake Erie; lake trout research; Lake Superior herring studies; controlled atmosphere storage; fishing methods and equipment assistance; consumer education; economic studies; and Great Lakes and inland waters statistics. Alaska Region activities emphasized king crab and shrimp studies; king crab stocks and biology; oceanography investigations; pink salmon ecology; Olsen Bay pink salmon studies; estimating pink salmon returns; pink salmon blood studies; Auke Lake investigations; technology of king crab; and technical assistance to small packers. In the California Area, work went forward on subpopulation studies of sardines; pelagic surveys; behavior studies; tuna operating cost studies; and marketing and education work. Activities in the Hawaii Area included research on the skipjack fishery; introduction of monofilament gill nets; and field trials with gill nets.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE ICHTHYOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, FISH AND WILDLIFE SERVICE, U. S. NATIONAL MUSEUM, WASHINGTON, D. C. 20560.

Contribution to the Knowledge of the Flyingfish Fauna (Exocoetidae) of the Pacific and Indian Oceans, by N. V. Parin, 42 pp., processed, 1964. (Translated from the Russian, Trudy Instituta Okeanologii, vol. 42, 1961, pp. 40-91.)

The Distribution of Deep-Sea Fishes in the Upper Bathypelagic Layer of the Subarctic Waters of the Northern Pacific Ocean, by N. V. Parin, 21 pp., processed, 1964. (Translated from the Russian, Trudy Instituta Okeanologii, Akademii Nauk SSSR, vol. 45, pp. 259-278.)

Systematics, Origin, and History of the Distribution of the Eurasian and North American Perches and Pike-Perches (Genera PERCA, LUCIOPERCA, and STIZOSTEDION), by A. N. Svetovidov and E. A. Dorofeeva, 32 pp., processed, 1964. (Translated from the Russian, Voprosy Ikhtologii, vol. 3, no. 4, 1963, pp. 625-651.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, October 1964, 10 pp., illus. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I--Fishery Products Production and Market Data, October 1964, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, August 1964, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 1014, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, October 1964, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 608, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

New England Fisheries--Monthly Summary, October 1964, 22 pp. (Market News Service, U. S. Fish and

Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

Seattle List of Brokers and Importers of Fishery Products, 1965, 6 pp., November 1964. (Fishery Market New Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Contains the name and complete address of every firm in Seattle, Wash., importing fishery products and their sources. It also lists all Customs House brokers in Seattle.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, October and November 1964, 9 and 7 pp. respectively. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the months indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Revised Bibliography on the Cutthroat Trout, by Oliver B. Cope, Research Report 65, 48 pp., illus., printed, 1964, 35 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AFRICA:

"Estimating the fisheries potential of African lakes," by M. J. Holden, article, New Scientist, vol. 24, no. 411, October 1, 1964, pp. 20-23, illus., printed, single copy 1s. 3d. (about 20 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. To provide part of the protein that is lacking in so many African diets the Uganda Fisheries Department is developing the fisheries on 5 large lakes as rapidly as possible by encouraging the use of

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better nets and better canoes with outboard motors, and also by providing markets for the increased catch. However, there is a limit to the maximum fish production from any body of water. In order that the fisheries should not be stimulated beyond this optimum level, the Department has initiated surveys of the lakes to assess their potential sustainable yields.

ALASKA:

Science in Alaska, 1962--Proceedings Thirteenth Alaskan Science Conference, Juneau, Alaska, August 22 to August 26, 1962, edited by George Dahlgren, Jr., 221 pp., illus., processed, April 25, 1963. Alaska Division, American Association for the Advancement of Science, College, Alaska. Among the many papers are 5 of the 9 papers on fisheries presented at the Conference: "The effects of toxaphene treatment on Kitoi Creek, Afognak Island, Alaska," by William L. Sheridan and William R. Meehan; "Loss of isthmus loop tags, *Paralithodes camtschatica* (Tilesius)," by George W. Gray, Jr.; "An experiment to improve an Alaskan salmon spawning area," by Donald E. Bevan; "A preliminary study of the migration and growth of the Dolly Varden char in Kitoi Bay, Alaska," by Leonard Revet; and "Growth of king crabs *Paralithodes camtschatica* (Tilesius) in the vicinity of Kodiak Island, Alaska," by Guy C. Powell. Also, there is a report on the general session on "Northeast Pacific Fisheries Program Planning."

ALGINS:

"Edible corn-carbohydrate food coatings. I--Development and physical testing of a starch-algin coating," by L. Allen and others, *Food Technology*, vol. 17, no. 11, 1963, pp. 99-104, illus., printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

ANCHOVIES:

"Manufacture of anchovies," by W. Brandenburg, article, *Fischerei-Forschung*, vol. 5, no. 6, 1962, pp. 21-25, printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

The Peruvian Anchovy Fishery 1959-1962--Statistics of Catch and Effort and an Attempt to Assess the Fluctuations in the Apparent Abundance of the Stock, by G. Saetersdal, I. Tsykayama, and B. Alegre, 1964 CalCAFI Conference Contribution No. 11, 37 pp., processed, 1964. Instituto del Mar del Peru, Callao, Peru.

BOTTOMFISH:

"Probable state of the resources and stocks of bottomfishes in the Barents Sea, 1963," by T. G. Maslov, article, *Nauchno-Tekhnicheskii Byulleten' PINRO*, no. 4, 1962, pp. 306, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii im. N. M. Knipovicha, Murmansk, U. S. S. R.

BYPRODUCTS:

Preliminary Recommended Sanitation Guidelines for Processors of Industrial Fishery Products, 10 pp., processed, February 1964. Agricultural Research Service, U. S. Department of Agriculture, Hyattsville, Md. 20781. These guidelines represent the

combined efforts of many individuals and groups interested in preventing *Salmonellae* infections in live-stock, poultry, and man. The report covers requirements for plant premises, transportation of raw and processed materials, containers for processed material, sampling and laboratory examination, training of employees, responsibility for compliance, cleaning agents, and disinfectants.

CANADA:

Noms Francais et Anglais des Poissons de l'Atlantique Canadien (French and English Names of the Canadian Atlantic Fishes), by Vianney Legendre, W. B. Scott, and Julien Bergeron, Report No. 2, 183 pp., processed in French and English, June 1964. Ministère du Tourisme, de la Chasse et de la Pêche, Province de Québec, Canada. Includes the French, English, and scientific names of fish by orders, families, and species, together with remarks on the derivation and citations from literary sources--301 species are listed.

Pêche (Fisheries), 16 pp., illus., printed in French and English. (Reprinted from *Quebec Yearbook 1963*, pp. 363-377.) The Quebec Department of Industry and Commerce, Quebec Bureau of Statistics, Montreal, Canada. Contains sections covering fishing at the Provincial, National, and world levels; commercial fishing territories; Quebec's maritime fisheries; capital equipment in primary operations; cold-storage plants; Quebec's island fisheries; fishing methods; and biology of cod. Includes statistical tables showing landings by continent, world catch in relation to Canadian and Quebec catches, 1938 and 1947-61; quantity and value, by species, of fish caught, 1960-62; marketed value by principal species, 1961-62; fishermen, vessels, investments and expenses, by area, 1962; cold-storage plants and their capacity in 1962; and total catches, fixed capital and fishermen, by county, 1962.

CANNING:

"Cooking under pressure of sardines and tunny fish," by R. Meesmaecker and Y. Sohler, article, *Revue de la Conserve*, vol. 18, no. 2, 1963, pp. 171-180, illus., printed in French. Societe d'Edition pour l'Alimentation, 1 rue de la Reale, Paris I, France.

"Experimental canning of low-valued fish," by M. I. Baukin, article, *Rybnoe Khozyaistvo*, vol. 39, no. 6, 1963, pp. 89-93, printed in Russian. Rybnoe Khozyaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

CARP:

"First attempt to breed carp in small Karelian lakes," by Yu. S. Dmitrenko, article, *Nauchno-Tekhnicheskii Byulleten' GosNIORKh*, vol. 15, pp. 43-46, printed in Russian. Gosudarstvennyi Nauchno-Issledovatel'skii Institut Ozerogo i Rechnogo Rybnogo Khozyaistva, Moscow, U. S. S. R.

CHOLESTEROL:

"The Nobel Prize for Medicine, 1964, the biochemistry of cholesterol," by J. W. Cornforth and G. J. Popjak, article, *New Scientist*, vol. 24, no. 414, October 22, 1964, pp. 220-221, illus., printed, single copy 1s. 3d. (about 20 U. S. cents). Cromwell House, Fulwood Fl., High Holborn, London WC1, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

COD:

These articles are from Materialy po Kompleksnomu Izucheniyu Belogo Morya, vol. 2, 1963, printed in Russian. Akademiya Nauk SSSR, Karelskii Filial, Moscow, U.S.S.R.:

"Polar cod of the Karelian coast of the White Sea," by A. M. Anukhina, pp. 144-158.

"Polar cod of the Solovetski Islands," by K. A. Altukhov, pp. 119-130.

These articles are from Materialy Rybokhozyaistvennykh Issledovaniy Severnogo Basseina, no. 2, 1964, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO," Murmansk, U.S.S.R.:

"Variations in age composition, sexual maturation, and spawning of cod on the Flemish Cap," by A. I. Postolankin, pp. 16-22.

"Vertical migrations and feeding of cod young in the Barents Sea, September-October," by A. S. Baranenkova, S. S. Drobysheva, and I. Ya. Ponomarenko, pp. 28-34.

"Biology of cod from the eastern part of Tatar Strait," by B. N. El'kina, article, Izvestiya Tikhookeanskogo, Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO," vol. 49, 1963, pp. 95-114, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

COD AND HADDOCK:

"Quantitative results of the estimates of the numbers of young cod and haddock in the Barents Sea during the winter 1961-62," by A. S. Baranenkova and Z. P. Baranova, article, Nauchno-Tekhnicheskii Byulleten' PINRO, no. 4, 1962, pp. 9-13, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii im. N. M. Knipovicha, Murmansk, U.S.S.R.

"Results of the estimates of abundance of young cod and haddock in the Barents Sea in winter," by Z. P. Baranova and G. P. Nizovtsev, article, Materialy Rybokhozyaistvennykh Issledovaniy Severnogo Basseina, no. 2, 1964, pp. 22-28, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO," Murmansk, U.S.S.R.

CONVERSION COEFFICIENTS:

"Conversion co-efficients for different kinds of fishery products," by H. Houwing, article, Conserva, vol. 11, no. 11, 1963, pp. 239-241, printed in Dutch with French summary. Maanblad voor de Voedings- en Genotmiddelen-Industrie, Moormans Periodieke, Pers N. V., The Hague, Netherlands.

CRABS:

"Acclimatization of Kamchatka crabs and blue crabs in the Barents Sea," by O. I. Orlov, article, Materialy Rybokhozyaistvennykh Issledovaniy Severnogo Basseina, no. 1, 1963, pp. 46-47, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO," Murmansk, U.S.S.R.

DOGFISH:

"Utilization of the flesh of picked dogfish for food purposes," by V. C. Berezenko, article, Rybnoe Khozyaistvo, vol. 39, no. 7, 1963, pp. 76-77, printed in Russian. Rybnoe Khozyaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

ECOLOGY:

"Methods and practice in the ecological analysis of the work of the fishing fleet in the Northern basin," by L. S. Nikol'skii, article, Materialy Rybokhozyaistvennykh Issledovaniy Severnogo Basseina, no. 1, 1963, pp. 54-56, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO," Murmansk, U.S.S.R.

EELS:

"Eel culture and its efficiency in the waters (reservoirs) of White Russia," by S. V. Kokhnenko and E. A. Borovik, article, Gidrobiologicheskie Issledovaniya, vol. 3, 1962, pp. 324-327, printed in Russian. Institut Zoologii i Botaniki, Akademiya Nauk Eston. SSR, Tartu, Estonian S. S. R.

ELECTRICAL FISHING:

"Biological premises for the development of electro-fishing in fresh water," by L. M. Nusenbaum, article, Nauchno-Tekhnicheskii Byulleten' GosNIORKh, vol. 15, pp. 65-68, printed in Russian. Gosudarstvennyi Nauchno-Issledovatel'skii Institut Ozerogo i Rechnogo Rybnogo Khozyaistva, Moscow, U.S.S.R.

"Technical principles of electric fishing," by S. K. Mal'kiavichus, article, Rybnoe Khozyaistvo, vol. 39, no. 4, 1963, pp. 42-52, illus., printed in Russian. Rybnoe Khozyaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

The following articles appeared in Nauchno-Tekhnicheskii Sbornik, printed in Russian. Klaipedscoe Ot-delenie Gipropriblota, Vilnyus, U.S.S.R.

"An electronic pulse generator (for marine electro-fishing)," by K. Pabedinskas, no. 3, 1963. pp. 93-99.

"Importance of the kind of impulses of electric current for producing galvanotaxis in Baltic herring (salaka) (on the problem of marine electrofishing)," by G. Daniyulite, no. 3, 1963, pp. 87-92.

"An impulse frequency meter (gear for electrofishing)," by K. Pabedinskas, no. 3, 1963, pp. 100-104.

"Impulse scheme for electro-fishing," by S. K. Mal'kiavichus, no. 2, 1962, pp. 117-133.

"Method of determining the working regime of the electrical part of the equipment for electrofishing," by A. A. Trakis, no. 3, 1963, pp. 80-86.

"Reaction of Atlantic herring to electrical current impulses," by V. Gedminas and G. Daniyulite, no. 2, 1962, pp. 138-143.

"Simple means for directing the tiratron impulse generator (for marine electrofishing)," by K. Pabedinskas, no. 3, 1963, pp. 105-110.

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ENZYMES:

"Tryptic enzymes from pyloric caeca of mackerel," by P. V. Kamasastri, *Science and Culture*, vol. 29, 1963, pp. 360-361, printed. Science and Culture, Indian Science News Association, 92 Upper Circular Rd., Calcutta 9, India.

EXPORTS:

Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States, processed, 1964, \$6. U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A new classification for United States export commodities was placed in effect January 1, 1965, and designated as Schedule B, 1965 Edition. The old Schedule B, in effect since 1958, became obsolete on December 31, 1964. Schedule B, 1965 Edition, contains some 3,600 classifications for export commodities, compared with 2,600 classifications under the old Schedule B. It shows 7-digit rather than 5-digit code numbers. The new export classification must be used for all shipments made after December 31, 1964, and the new 7-digit numbers must be reported for all such shipments. The 1965 edition is a looseleaf manual which lists the 3,600 classifications (each designated by code number) and approximately 30,000 products assigned to the various classifications for illustrative purposes. The manual includes an alphabetical index which directs the exporter to the page or pages where classifications or products may be found. In addition, it includes two numerical indexes: one shows the old Schedule B numbers and the new code numbers into which they go; the other shows the new Schedule B numbers and the old Schedule B numbers of which they are composed.

FAROE ISLANDS:

Faroes in Figures, no. 27, September 1964, 6 pp., illus., printed. *Føroya Fiskasøla*, Torshavn, Faroe Islands. This issue contains an article, "Development of the Faroese fishing fleet," which discusses the renewal and enlargement of the fishing fleet after World War II, the Faroe Fishing Vessel Mortgage Finance Corporation, and the purchase of steel vessels for long-line fishing. Also includes statistical tables showing exports of saltfish and dried codfish and production of saltfish for the first 6 months of 1964; a financial statement of the Faroe Fishing Vessel Mortgage Finance Corporation as of April 1964.

FISH BEHAVIOR:

Importance of Mechanical Stimuli in Fish Behavior, Specially to Trawls, by C. J. Chapman, 10 pp. illus., processed in English with French and Spanish summaries. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Paper presented at the Second World Fishing Gear Congress, London, May 25-31, 1963.

"Underwater observations on the behavior of fishes during the 22d cruise of the research ship *Tunets*," by O. N. Kiselev, article, *Nauchno-Tekhnicheskii Byulleten' PINRO*, no. 1 (19), 1962, pp. 23-24, printed in Russian. *Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii im. N. M. Knipovicha*, Murmansk, U.S.S.R.

FISHERY RESOURCES:

Development of Fishery Resources, by G. C. Rawson and J. N. N. Adjetey, processed in English with French, Russian, and Spanish summaries. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Paper presented at UN Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas, Geneva, Feb. 4-20, 1963.

FISH FARMS:

"Prospects for the development of the collective and state fish farms in White Russia," by E. P. Leonenko, article, *Gidrobiologicheskii Issledovaniya*, vol. 3, 1962, pp. 328-330, printed in Russian. *Institut Zoologii i Botaniki, Akademiya Nauk Eston. SSR*, Tartu, Estonian S.S.R.

FISH FINDERS:

These articles are from *Materialy Rybokhozyaistvennykh Issledovaniy Severnogo Basseina*, no. 2, 1964, printed in Russian. *Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO"*, Murmansk, U.S.S.R.

"Use of electronic recordings (In search for fish and bottom)," by O. E. Shatoba and M. N. Shcherbino, pp. 145-148.

"Use of echo sounder in fishing under ice," by A. A. Gan'kov and O. N. Kiselev, pp. 148-151.

FISHING TECHNIQUES:

"Results of scientific investigations aimed at improvements of fishing techniques," by A. I. Treshchev, article, *Trudy VNIRO*, vol. 47, 1962, pp. 7-27, illus., printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

FISH PROTEIN:

Preparation of a Whipping Agent, by A. G. Bonagura and R. J. Mashy, Canadian Patent 663,558, printed, May 21, 1963. Canadian Patent Office, Ottawa, Canada.

FLOUNDER:

"Fishery-biological characteristics of the yellow-finned flounder of Southern Sakhalin," by N. S. Fileev, article, *Izvestiya Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii "PINRO"*, vol. 49, 1963, pp. 3-64, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

FOOD SERVICE:

Food Service in Private Elementary and Secondary Schools, by Martin Kreisberg, Marketing Research Report No. 678, 25 pp., illus., processed, October 1964. Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C. 20250. The market for food in private schools has grown rapidly, according to this report. Cash receipts for food served in the Nation's private schools were about \$9 million during March 1962, or \$75 million for the school year. Larger schools, those with enrollments of 500 or more, accounted for almost 60 percent of the total private school market. A major portion--\$60 million worth--of the food used in the 1962/63 school year was pur-

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chased locally through regular commercial channels. The rest of the food served was donated by the Federal Government pursuant to existing legislation. To expand the market for food in private schools and to provide the children with nutritious lunches, a two-fold effort is indicated: (1) increase the participation by pupils in schools now serving lunches under the National School Lunch Program; and (2) facilitate the establishment of lunch services for schools where lunch facilities are not available, and where the burden of needy children may be too great for those associated with the school to support school feeding.

FRESH-WATER FISH:

"Creation of stocks of commercial fishes in the Volgograd Reservoir," by A. N. Yakovleva, article, *Nauchno-Tekhnicheskii Byulleten' GosNIORKh*, no. 15, 1962, pp. 3-6, printed in Russian. Gosudarstvennyi Nauchno-Issledovatel'skii Institut Ozerogo i Rechnogo Rybnogo Khozyaistva, Moscow, U.S.S.R.

Our Freshwater Fishes, Educational Series, Picture Nos. 1, 2, 3, and 4, 1964, \$1.50 a set. R. E. Eshmeyer, 224 Elizabeth St., East Lansing, Mich. 48823. An educational series of four 6x9-inch plastic-coated cards showing 36 species of fresh-water fish in full-color photographs. In spite of the fact that color photographs are quite common today, there is still a lack of good color photographs of fish and other marine animals. The pictures shown on these cards show the color of living fish--something which is difficult to capture. Each card shows nine species of fish, and the back of the card has concise life history notes on each fish. The fish shown on the cards are: bluegill, smallmouth bass, black crappie, pumpkinseed, largemouth bass, greensunfish, northern longear sunfish, rock bass, warmouth, lake trout, sea lamprey, yellow perch, brown trout, brook trout, lake whitefish, rainbow trout, walleye or yellow pike, brown bullhead, black bullhead, and lake sturgeon. Also shown are: longnose gar, bowfin, carp, white sucker, river herring, white bass, channel catfish, freshwater drum, northern pike, golden shiner, muskellunge, grass pickerel, common shiner, tiger muskie, creek chub, and river chub. Teachers, educators, students, biologists, researchers, restaurants, and dealers will find these color photograph cards ideal for differentiating between and identifying the most common fresh-water fish species. Others interested in fisheries will find that the cards would lend themselves to framing. The author-photographer also has completed 11 fish pictures for the Society for Visual Education's 13x18-inch cards for schools; he is also able to supply transparencies of about 50 species of fresh-water fish.

-- J. Pileggi

FROGS:

"On frog legs," article, *Fish Technology Newsletter*, vol. 14, no. 3, 1963, p. 1, printed, Central Institute of Fisheries Technology, Ernakulam, India.

FROZEN FISH:

"Bacteriological examination of detailed packed frozen cod and plaice filets," by B. V. Jorgensen, article, *Konserves og Dybfrost*, vol. 20, no. 8, 1962, pp. 94-99, illus., printed in Danish. Teknisk Forlag, Vester Farimagsgade, 31, Copenhagen V, Denmark.

"Defrosting frozen food, particularly fish, with high frequency energy," by J. Reiske, article, *Fischerei-Forschung*, vol. 5, no. 6, 1962, pp. 29-38, printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

GERMAN FEDERAL REPUBLIC:

"The new look of Hamburg's fish harbor," by E. Gramcko and W. Mannitz, article, *Allgemeine Fischwirtschaftszeitung*, no. 22, 1963, pp. 20-24, illus., printed in German. Verlag Carl Th. Gorg, P. O. Box 406, Bremerhaven F, Federal Republic of Germany.

GREENLAND:

"Investigation of the natural resources for trawl fishing in Western Greenland," by L. N. Pechenik and I. N. Sidorenko, article, *Nauchno-Tekhnicheskii Byulleten' PINRO*, nos. 2-3, 1962, pp. 11-16, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii im. N. M. Knipovicha, Murmansk, U.S.S.R.

HADDOCK:

"Method of searching for haddock immigrations into the southeastern areas of the Barents Sea," by M. A. Sonina, article, *Nauchno-Tekhnicheskii Byulleten' PINRO*, nos. 2-3, 1962, pp. 24-27, printed in Russian. Polarnyi Nauchno-Issledovatel'skii i Proektnyi Institut Morskogo Rybnogo Khozyaistva i Okeanografii im. N. M. Knipovicha, Murmansk, U.S.S.R.

HERRING:

These articles are from *Rybnoe Khoziaistvo*, printed in Russian. *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

"Chemical characteristics of smoked and liquid-smoked herring," by A. I. Iuditskaia and T. M. Lebedeva, vol. 39, no. 2, 1963, pp. 79-94.

"Determination of the degree of ripeness of herring," by L. L. Konstantinova and K. I. Pakhimova, vol. 39, no. 7, 1963, pp. 74-75.

Life History and Present Status of British Columbia Herring Stocks, by F. H. C. Taylor, Bulletin No. 143, printed, C\$1.75. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

"Monatskarten der Deutschen grossen herengsfischerei für 1963" (Monthly reporting of German high-seas herring fishery for 1963), by K. Schubert, article, *Informationen für die Fischwirtschaft*, vol. 11, no. 3, 1964, pp. 110-117, illus., printed in German. Bundesforschungsanstalt für Fischerei, Palmallee 9, Hamburg-Altona 1, Federal Republic of Germany. As in the last few years, the captains of the high-seas herring fishery have made extensive reports on their catches. With the support of shipowners and of the Association for the Promotion of Fishery Research, 91 percent of all landings were reported. Monthly maps on the fishing effort and landings were prepared on the basis of that material. Altogether 8 maps were prepared for the drift-net and 12 maps for the bottom trawl-net fishery. The drift-net fishery maps show (by using black spots) quite clearly a better herring catch in the northern and middle part of the North Sea from May to September 1964 as compared to the previous

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year. In the southern North Sea and in the English Channel, there was no improvement of the catch and none is foreseen. The monthly maps for bottom trawl fishing also indicate a better herring catch from January to April 1964 as compared with 1963. The distribution of the black spots relating to June to October fishing, confirms a better herring catch but it also shows the effect of the cold winter in 1962/63 on summer water temperatures. The data on the trawl fishery in the southern North Sea and the English Channel in November and December confirm poor catch possibilities in that area.

"Results of herring tagging in Sakhalin waters in 1956-60," by A. D. Druzhinin, article, *Izvestiya Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii "TINRO"*, vol. 49, 1963, pp. 65-69, printed in Russian. Four Continent Book Corp., 156 5th Ave., New York, N. Y. 10010.

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Conclusions & Recommendations of Seminar on Marine Products Exports, Ernakulam, September 1964, 78 pp., processed, Oct. 7, 1964. Indian Institute of Foreign Trade, New Delhi, India. In the program of intensive studies of export problems on commodity-wise and country-wise basis, the Indian Institute of Foreign Trade, in collaboration with the Marine Products Export Promotion Council, organized a 3-day Seminar on marine products exports at Ernakulam, on September 17-19, 1964. The Seminar discussions covered the entire range of problems pertaining to production, processing, quality control, overseas marketing, and publicity of the marine products. Sixty-four participants drawn from the industry and trade, Export Promotion Councils, concerned Ministries and Departments of the Central and State Governments, export houses, processors, package manufacturers, and research associations, attended the Seminar. After a general discussion in the opening session, the Seminar broke into 3 groups for detailed consideration of the problems comprising the specific areas of studies allotted to them. These groups met on September 18. Group I dealt with the "Problems of Production"; Group II considered the "Problems of Processing and Quality Control"; and Group III was concerned with the "Problems of Overseas Marketing." Reports of the 3 groups were presented in the concluding session of the Seminar on September 19, when the recommendations and conclusions of the Seminar emerged. A major recommendation emanating from this Seminar relates to the preparation of a master plan embodying all essential details in respect of the requirements of large and medium fishing vessels and trawlers, improvement of the indigenous boats, establishment of cold storages, ice plants, additional water supply, creation of additional processing capacity, and mobilizing the overseas effort.

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-- Lorry Nakatsu

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are ways in which the owner of a small manufacturing company can help his customers to pay their past due debts.

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JAPANESE PUFFER FISH

The Japanese puffer fish, Sphoerides rubripes, contains poisons 50 times as deadly as strychnine and 1,000 times as lethal as cyanide. Yet the fish is eaten throughout Japan as a culinary delight, "fugu." Only highly skilled and licensed Japanese cooks prepare "fugu" by removing the ovaries, roe, liver, and skin to remove the source of the fish's poison. But despite the efforts of the Japanese Government to control "fugu" preparation, many Japanese and foreign visitors alike join their departed ancestors each year because "fugu" was "out of this world" for them.

The fish's poisons--tetrodotoxin and tarichatoxin--are among the most deadly known. It is estimated that a teaspoon of pure toxin from the puffer fish would kill seven million mice on the spot. (Science News Letter, August 29, 1964.)



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* * * * *

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P. 29 (fig. 1)--Robert K. Brigham; pp. 28, 29 (fig. 2), 66, and 111--U.S. Coast Guard; pp. 39 (fig.) and 40--J. Pileggi; p. 46--F. T. Piskur; p. 56--A. W. Anderson, U.S. Regional Fisheries Attache (Europe); pp. 73-75--R. S. Croker; p. 77--Milton J. Lindner; pp. 80 & 81--Burmeister & Wain, Denmark.

U. S. COAST GUARD'S ALASKA PATROL

The U. S. Coast Guard on September 4, 1964, opened a new chapter in its 97-year operation of the famed Bering Sea Patrol by renaming it the Alaska Patrol. The former name was not sufficiently descriptive of the modern Patrol's many law enforcement and conservation tasks, Coast Guard officials said.



The 269-foot icebreaker Northwind from Seattle has been the most famous of the U.S. Coast Guard cutters involved in the multi-phased operations of the Bering Sea Patrol (now renamed the Alaska Patrol) during the past 20 years. To her has fallen the lot of performing the heavier jobs in Arctic ice in addition to other Patrol duties. With increased emphasis on oceanographic surveys, which are of great value to Alaskan fisheries, the icebreaker has devoted part of her annual summer Patrols since 1962 to that work. Here the Northwind is seen stabbing through the ice-jammed East Siberian Sea during an oceanographic mission which started from the northern tip of Pt. Barrow.

Over the years, the tempo and scope of the Patrol's work have increased steadily, reflecting Alaska's dramatic rise to Statehood. Its responsibilities now embrace a wide arc from the Canadian border on the south to the Beaufort and Chukchi Seas and Arctic Ocean on the north.

This action marks a new phase in the Coast Guard's long collaboration with Alaska which started in July 1867, shortly after the United States purchased it from Alexander II, Czar of all the Russias.

In its nearly a century of operation, the Patrol has become legend in the far northwest. In 1867, the Revenue Cutter Lincoln hauled anchor at San Francisco and headed for northern seas. Her mission was to carry out the first United States exploration of the waters and natural wealth of the newly acquired territory. When the Lincoln arrived, Alaska was largely uncharted wilderness. There was only one lighthouse and a few widely scattered Russian outposts.

(Continued on next page)

During the early years of the Patrol, the captains of the Revenue cutters and later the Coast Guard cutters were virtually the only law in the territory. As United States Commissioners, they heard evidence, conducted trials, and dispensed swift and effective Justice.

By the 1890's, the slaughter of Alaska's fur-bearing animals and fish had become so great as to be an international scandal. United States and foreign adventurers were looting the territory's immense natural resources. They had to be curbed quickly, if only to protect the natives in their fight for survival. Therefore, in 1895, the Revenue Cutter Service, direct ancestor of the Coast Guard, sent additional cutters north to form an official Bering Sea Patrol Force. This was, in effect, a strengthening of patrol operations which had begun 28 years before.

In the years which followed, treaties were negotiated with Russia, Japan, and Great Britain to regulate sealing and fishing in Alaskan waters. Chief enforcement agency for those international conventions was the Patrol. This remains one of its major functions.

Until this year, the Patrol brought medical and dental care to Eskimo natives of remote northern Alaska. For those isolated people, the yearly arrival of a Coast Guard cutter with its Public Health medical and dental personnel was an eagerly awaited event. This year, however, Public Health medical officers will be flown to native villages. Increasing efficiency of air travel in Alaska has made this a faster way to transact business.

Part of the 1964 Patrol was carried out by the Coast Guard cutter Northwind. Her mission was to conduct oceanographic studies of northern waters and perform law enforcement and conservation tasks. Marine studies were made at Alaska's northernmost tip at Point Barrow, and her crew took bottom soundings and made seismic surveys of the ocean floor. These latter studies may help to throw light on the conditions which produced so catastrophic an earthquake as the one in March 1964 along Alaska's southern coast.

Usually, the Patrol extends from April to November. In addition to the Northwind, a number of other major cutters also participate in the operation. They include the Klamath, Wachusett, Storis, and others. Most of the Patrol's work is in the area of the Aleutians and the Gulf of Alaska where a combined air-surface reconnaissance is carried out. Coast Guard vessels from Seattle, Juneau, and Ketchikan work closely with long-range planes based in Kodiak, Alaska. The Patrol's oceanographic studies are of great value to Alaska's fishing industry.



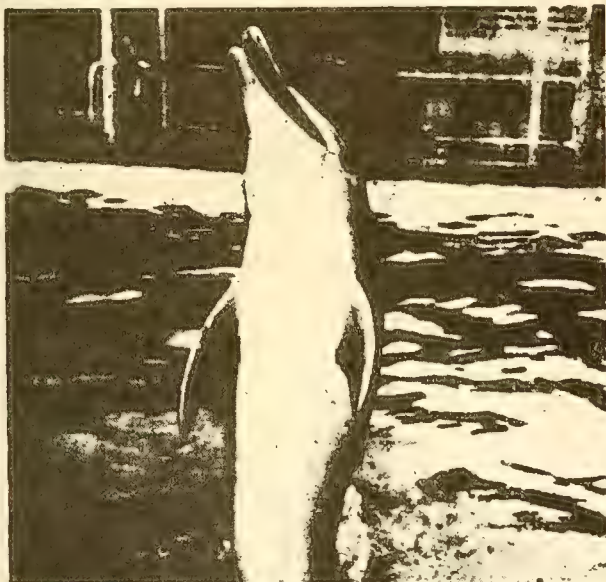
ALASKA A REAL BARGAIN

In 1962 alone, the money paid to fishermen and vessel owners for pink salmon caught in Central Alaskan waters exceeded the \$7.2 million paid to Russia in 1867 for all of Alaska. In value of total fish landed, California leads all states, followed by Alaska, Massachusetts, Florida, and Texas. These five states normally produce more than 50 percent of the total value of the U. S. catch.

DOLPHIN RATED TO BE ACCURATE FISH FINDERS

The general belief that the dolphin and its smaller counterpart, the porpoise, are friendly, intelligent, and harmless is not shared by some fishermen who blame them for destroying and damaging their nets, and chasing away schools of fish.

Marine scientists rate dolphin and porpoise as highly intelligent creatures. Tests have been made that seem to put the dolphin's intelligence on a par with man's. It is pointed out that dolphin learn more rapidly than man, and that they have a proportionately larger brain than man. And also that this brain is highly convoluted or full of wrinkles and folds; a quality which physiological psychologists say is related to intelligence.



A dolphin, which most Australians call a porpoise, leaps high to take food tossed to it in a marineland at Tweed Heads, on the N. S. W. -Queensland border.

Another thing that has been observed is that dolphin seem to talk to each other. Every fisherman knows how playful they are and how they are always surrounded by a number of their own kind. If you were to go skin diving among dolphin or porpoise you would hear a collection of odd squeals, burps, and clicks.

A scientist of the Woods Hole Oceanographic Institute has studied the voice of the porpoise as intensively as any man. He has made hundreds of recordings of dolphin sounds and analyzed them in many ways. One of his most interesting discoveries is the way a dolphin finds fish by sound waves. When a dolphin is fishing he sends out a series of clicks separated by a second or two. The instant the dolphin detects a fish his click rate increases and as he closes in on his victim, his rep rate speeds up in inverse proportion to the distance between himself and his prey. Just before the dolphin clamps his jaws on the fish his sonar signal reaches the pitch of a high buzz--almost a squeak.

According to the scientist, the dolphin's sonar has remarkably accurate directional qualities.

He theorizes that the dolphin generates his probing sound pulses deep inside his head and that the sound is led by a sort of cartilage wave guide to a dish-shaped bone in the upper part of the dolphin's head. The dish-shaped bone acts like a reflector and the fatty covering tissue called the melon acts like a lens for sound waves directing and focusing them in a sharp beam towards the target. The ears of a dolphin are widely separated and this binaural hearing greatly improves his directional sense. In this respect the dolphin has got it way over the average mechanical fish finder.

Another advantage the dolphin has is his variable rep rate. When he's near his target he sounds on it more rapidly and thus gets more precise information about it. There is some reason to believe that the fish-detecting machine of the dolphin is so perfected that its entire operation is automatic, that each returning echo triggers the next outgoing noise burst, and that the dolphin is virtually unaware of it happening--much as the iris of your eye adjusts itself to cope with different strengths of light.

It is surprising indeed how closely man has imitated the dolphin in his modern fish finders without realizing that the dolphin had beaten him by millions of years. (Australian Fisheries Newsletter, June 1964.)

U. S. BUREAU OF COMMERCIAL FISHERIES

ORGANIZATION OF NORTH ATLANTIC REGION



The Regional Structure: The Regional Office, located in Gloucester, Mass., exercises administrative supervision over a broadly diversified group of research and service activities. These programs are designed to secure fundamental information on the resource, improve the harvesting, processing, and use of fish and fishery products, and provide direct technical, economic, statistical, and marketing assistance to the industry. Individual research and service programs are carried out in 7 major laboratories, 12 major field offices, and 17 smaller field stations. Seven vessels are used in coastal and offshore research.

--Excerpt from "A Program of Fishery Research and Services North Atlantic Region (Region 3, Bureau of Commercial Fisheries, Gloucester, Mass.), Circular 164 (May 1963).

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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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5/31/68

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COVER: Atlantic skipjack tuna in the hold of an East Coast purse-seiner. This is part of a 44-ton set made 40 miles south of Block Island, R. I., August 6, 1963. The fish range in size from 7-10 pounds. Quantities of skipjack were first discovered off the Atlantic Coast states in 1962; over 3,000 tons were taken during the 1963 tuna purse-seining season. (See p. 1 of this issue.)

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PORTABLE CLOUD-MAKING MACHINE HELPS CHECK GROWTH OF AQUATIC WEEDS

A portable machine that creates a constant underwater cloud has been developed to help halt the growth of troublesome aquatic weeds along shorelines. The apparatus, which contains a pump and a series of hoses with holes, uses water or air-pressure jets to agitate materials on the sea bed, thus creating a muddy cloud. The cloud shades the sea bottom from the sun, which is necessary for the germination and growth of aquatic weeds.

The cloud has to be maintained only during the early spring or summer in the germinating period of the weeds. Then the apparatus can be removed and the treated area will remain weed-free for the rest of the year.

The cloud-making machine, which was invented by a resident of Annapolis, Md. (Patent No. 3,151,463), can also spray liquid weed killers. (Science News Letter, October 24, 1964.)



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REVIEW OF THE DEVELOPMENT OF THE ATLANTIC COAST TUNA FISHERY

By Peter C. Wilson*

ABSTRACT

Bluefin tuna are seasonally abundant along the New England coast where they have been of minor commercial importance for many years. In 1951 the U.S. Fish and Wildlife Service began investigating that resource to determine whether a New England tuna fishery was feasible. The results of those investigations showed that several different species of tuna were present in the Northwest Atlantic beyond the U.S. Continental Shelf. The Fish and Wildlife Service sponsored purse-seine trials in 1951 and 1954, and the 1958-61 operations of a commercial vessel (with which the Service's Bureau of Commercial Fisheries cooperated) demonstrated that commercial quantities of bluefin tuna could be harvested in New England waters. During 1962 and 1963 the new tuna fishery had a purse-seine fleet of 16 United States and 2 Canadian vessels. The season lasted 5 months and the fishing area included all of the Continental Shelf from Virginia to Massachusetts. A skipjack resource was also discovered. In 6 years the Atlantic Coast tuna purse-seine catch rose to 9,000 short tons, including 3,000 tons of skipjack.

BACKGROUND

Until recent years the tuna stocks off the Atlantic Coast of the United States were largely ignored because no ready market for them existed. Other tuna species were noted occasionally, but the bluefin tuna (*Thunnus thynnus*) was long considered the major tuna resource in the Northwest Atlantic.

This belief can be attributed to seasonal catches and occurrence of "horse mackerel" or bluefin tuna from Cape Hatteras to Nova Scotia, and to the substantial catches made by commercial and sport fishermen in the northern part of the tuna's range (table 2).

Annual tuna movements into the coastal waters of the Northwest Atlantic had received very little attention prior to 1950. Bluefin tuna generally arrive on the Continental Shelf north of Cape Hatteras during June and remain as late as October. It is not known where they come from or where they go between their seasonal visits. Records show that arrivals, departures, abundance, and availability of differ-

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Table 1 - Summary Data on the U. S. Atlantic Coast Purse-Seine Tuna Fishery^{1/}

	2/1963	2/1962	1961	1960	1959	1958
	(Tons)					
Catch:						
Bluefin	5,933	3,379	1,032	338	757	185
Skipjack	3,195	479	-	-	-	-
Total	9,128	3,858	1,032	338	757	185
Number of vessels	18	7	2	1	1	1
Total capacity (tons)	5,525	1,015	125	45	45	45
Average capacity (tons)	307	145	63	45	45	45
Catch per vessel (tons)	507	551	516	338	757	185
Number of trips	128	100	86	20	30	29
Catch per trip (tons)	71.3	38.6	12.0	16.9	25.2	6.4
Days fished (all vessels)	3/	387	96	22	31	32
Catch per fishing day (tons)	3/	10.0	10.8	15.4	24.4	5.8
Length of season (days)	126	120	90	38	55	72
Number days fish caught	3/	59	44	12	21	18

^{1/}Data based on logbooks and interviews; catches do not reflect landed tonnage.

^{2/}1962 and 1963 figures are preliminary; data from 2 Canadian vessels are included in 1963

^{3/}Data not completed.

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ent size groups vary considerably from year to year. The larger tuna (over 100 pounds) have dominated the catches north of Cape Cod, while the smaller sizes were caught frequently from Cape Cod Bay south (Bigelow and Schroeder 1953).

COMMERCIAL CATCHES: The Atlantic Coast tuna resource has been a matter of commercial speculation as long as tuna have been observed and taken in those waters. Until 1959, with some exceptions, Massachusetts pound nets caught most of the bluefin tuna landed in New England. Most of those tuna were marketed as fresh fish in New England and New York.

Several vessels operating out of Gloucester, Mass., during the period 1937 to 1941, attempted purse seining for bluefin tuna (Murray 1952; table 2). Except for the Western Explorer, a California purse-seine vessel using a West Coast tuna seine, the small fleet was equipped with modified mackerel seines. The low price paid for the fish and the extensive damage to the light mackerel nets eventually resulted in discontinuation of the fishery. In 1937 the first bait-fishing for bluefin tuna in the Northwest Atlantic was tried. The Gloucester schooner-dragger Elvira Gaspar was rigged with two racks, a bait tank, and poles, and fished with live herring bait during July and August off southern Maine and on the southeast part of Georges Bank. Failure to catch any tuna was attributed to "wild" fish and difficulty in keeping the bait alive.

In years of abundance, significant bluefin tuna catches in New England have been made with other types of gear. During 1949, harpoons accounted for 160,000 pounds and hand lines for 1,415,300 pounds. Occasional large catches have been made from small boats using long-line gear (Wilson 1960).

PROCESSING: Lack of uniform-size fish in the catches and an unpredictable supply complicated early processing attempts. Several small-scale canning operations were established for short periods, starting as early as the late 1920's in Gloucester, Mass. Raw tuna supplies consisted almost entirely of local bluefin from purse seines, traps, harpoons, and hand lines. One notable exception was the 1952 landing of 172,300 pounds of skipjack and 412,000 pounds of yellowfin tuna in Gloucester by the West Coast bait-boat Sun Jason (Slavin and Smith 1963). None of that catch was taken from the Northwest Atlantic, and the vessel did not fish in those waters after leaving Gloucester.

EXPLORATORY FISHING

GULF OF MAINE EXPLORATIONS: A number of interrelated factors hindered development of a tuna fishery. These were: (1) the shortness of the season, (2) uncertain annual availability of raw tuna supplies, (3) excessive size range, (4) lack of proper vessels and gear, and (5) lack of adequate canning facilities. In 1950, Congress took an early step to resolve

Table 2 - Atlantic Coast Bluefin Tuna Catches Landed in the United States, 1930-63^{1/}

	Purse Seine	Traps	Other	Total
	(1,000 Pounds)			
1963 ^{2/} . . .	12,456	3/	3/	3/
1962 ^{4/} . . .	6,620	3/	3/	3/
1961 . . .	1,992	174	201	2,367
1960 . . .	611	450	343	1,404
1959 . . .	1,722	667	429	2,818
1958 . . .	304	1,916	256	2,476
1957 . . .	-	891	110	1,001
1956 . . .	1	399	59	458
1955 . . .	1	830	65	896
1954 . . .	122	1,170	136	1,428
1953 . . .	-	1,688	257	1,945
1952 . . .	-	298	267	565
1951 . . .	221	1,081	458	1,761
1950 . . .	2	764	501	1,267
1949 . . .	1	1,100	1,637	2,738
1948 . . .	1	1,881	1,113	2,995
1947 . . .	1	435	651	1,087
1946 . . .	-	668	517	1,185
1945 . . .	-	446	937	1,383
1944 . . .	10	321	498	829
1943 . . .	1	170	309	480
1942 . . .	1	231	595	827
1941 . . .	3/	3/	3/	3/
1940 . . .	302	321	532	1,155
1939 . . .	311	202	437	950
1938 . . .	978	598	247	1,823
1937 . . .	137	672	213	1,022
1936 . . .	3/	3/	3/	3/
1935 . . .	17	234	317	567
1934 . . .	3/	3/	3/	3/
1933 . . .	-	318	130	448
1932 . . .	43	156	117	316
1931 . . .	-	157	165	322
1930 . . .	-	131	165	296

1/Traps include pound nets, floating traps, and weirs; other includes hand lines, otter trawls, harpoons, troll gear, etc.

2/Preliminary, includes 2,118,000 pounds skipjack and 3,272,000 pounds mixed bluefin and skipjack in 1963; additional 5,800,000 pounds bluefin and skipjack were landed in Canada and Puerto Rico.

3/Data not available.

4/Preliminary, includes 942,000 pounds skipjack in 1962; additional 690,000 pounds bluefin tuna were landed at Puerto Rico.

Source: 1930-61--Fishery Statistics of the U.S., Annual Reports, and 1962-63--Fishery Market News Service, Boston, Mass., logbooks, and interviews.

some of these problems through initiation of a Fish and Wildlife Service exploratory study of the New England bluefin tuna potential. One of the principal objectives was the testing of various fishing gears to determine the most efficient methods for capturing tuna in commercial quantities. Purse-seine operations were started with two West Coast-type vessels, the Western Explorer in 1951 and the Western Pride in 1954 (Murray 1952, 1955). Long-line, gill-net, and trammel-net trials were conducted from the chartered schooner Marjorie Parker in 1952 and 1953 (Murray 1953, 1954).

Results of the explorations were encouraging but inconclusive. The purse-seine method was found to be the most promising, and stocks of bluefin tuna sufficient to support a New England tuna industry were observed in coastal waters during summer.

Four years of explorations generated interest in a New England tuna fishery but very little activity on the part of the industry. A sardine cannery, located at Eastport, Maine, installed tuna-canning equipment in 1951 and operated intermittently. In 1954, a Bureau-owned tuna purse-seine and accessory gear were offered for loan to any commercial fisherman who would convert his vessel for tuna seining in New England waters and thus undertake a cooperative tuna-seining operation with the Bureau. The offer was not accepted until 1958. No additional vessels entered the fishery at that time.

CONTINENTAL SHELF EXPLORATIONS: The Bureau began two new projects to help develop a tuna fishery. The Bluefin Tuna Exploration project, initiated in 1955, made further investigations on the Continental Shelf off New England. The Oceanic Tuna Exploration project, started in 1956, concentrated on tuna surveys beyond the Continental Shelf. After those two projects ended in 1960, the Pelagic-Oceanic project, started in 1961, continued oceanic tuna survey work.

Under the Bluefin Tuna Exploration project live-bait fishing for bluefin tuna was tried during two cruises in waters south of Cape Cod in the summer of 1955. During one of the cruises (aboard the chartered vessel Stormy Weather II), 2,500 pounds of tuna were caught 20 miles south of Martha's Vineyard on August 16--the first tuna catch in the Northwest Atlantic by that method. Poles were rigged with feathered barbless hooks, and live butterfish were used as bait.

The most important single development in the establishment of the New England tuna fishery came in 1958 when the owner of a Provincetown, Mass., trawler, the Silver Mink, agreed to fish for bluefin tuna in New England waters using the Bureau's purse seine and other gear originally offered in 1954 (Squire 1959). After initial success, a 28-inch power block was added under the agreement in 1959--the first application of such equipment to tuna purse seining in New England. Beginning in 1959, the linen and cotton seine net was replaced gradually with nylon webbing.

OCEANIC EXPLORATIONS: Explorations on the Continental Shelf were designed to provide a base for the immediate development of the tuna fishery. To aid in the long-range support of the fishery, oceanic tuna explorations were planned to provide background knowledge of the tuna resource over a much wider range of the Northwest Atlantic.

No knowledge of extensive tuna stocks beyond the Continental Shelf was available, but Bigelow and Schroeder (1953) had suggested that New England bluefin tuna may winter in deep water along the Continental Slope off the Middle Atlantic coast. Eight cruises of the Bureau's vessel Delaware (Squire 1962) and one cruise of the Woods Hole Oceanographic Institution's vessel Crawford (Mather and Bartlett 1962) resulted in significant catches of bluefin and yellowfin tuna (Thunnus albacares) on long-line gear fished in those waters at various times of year.

While long-line tuna catches have no direct correlation with commercial purse-seining potential, the catch rates do indicate relative abundance of tuna in subsurface layers, and provide distributional information unobtainable with surface sampling gear. Long-line catches in waters south of New England from the Continental Slope to the northern edge of the Gulf Stream

indicated unusually high concentrations of bluefin tuna just before the fish appear in the in-shore fishery and shortly after they depart. The recovery, from the inshore purse-seine fishery, of five bluefin tuna tagged and released from the offshore catches (F. J. Mather III, personal communication, and Mather 1960) suggests that availability of bluefin tuna in the seasonal fishery may be related to subsurface bluefin distribution and abundance observed from long-line catches in the adjacent oceanic waters.

CAPE COD FISHERY, 1958-61

"SILVER MINK:" The first tuna purse-seining season was an experimental one for the Silver Mink, a southern shrimp vessel that had been converted to trawling for industrial fish (fig. 2).¹ Other than 2 days spent scouting east of Cape Cod, and 3 days off Block Island, the entire 72-day season was fished in Cape Cod Bay and adjacent waters (table 3). Twenty-six out of 42 sets were successful. Average size of the fish in the catches ranged from 60 to 80 pounds; schools ranged from 1 to 60 tons and averaged about 16 tons. Shoal-water fishing, with resultant mudding of the nets, and large schools caused extensive net damage. Fish were landed the day they were caught and trucked from Provincetown to the cannery at Eastport, Maine.

In 1959 the Silver Mink quadrupled its previous year's catch in a shorter fishing season of 55 days. An all-nylon seine and a power block, in addition to experience gained the first year, contributed to this success. Daily average size of the fish ranged from 118 to 142 pounds during the season, and the size of the fish for the entire season averaged 131 pounds. The smallest day's catch was about 10 tons; the largest was 130 tons, requiring aid from several vessels to land the catch. All operations were within a day's run from Provincetown and catches again were trucked to the Maine cannery. A decrease in the 1960 catch (table 3) resulted primarily from decreased fishing effort, caused by unsettled market conditions.



Fig. 2 - The Provincetown, Mass., purse seiner Silver Mink working a 10-ton set of bluefin tuna in Cape Cod Bay, September 1961.

NEW TUNA PACKING CORPORATION: Two events in 1961 gave the struggling tuna fishery a renewed outlook for the future. A newly formed tuna packing corporation leased the Eastport, Maine, facilities. This provided a ready market for local purse-seine caught tuna. Secondly, the new corporation started construction of a small purse seiner at Warren, R.I., to supplement its raw tuna supply. Although the 80-ton capacity F. Nelson Blount did not commence fishing until August 24 (the middle of the tuna season), that vessel and the Silver Mink together produced over 1,000 tons of bluefin tuna by mid-October (table 3). Both vessels fished Cape Cod Bay exclusively. Daily average sizes of fish during July and August were high--180 to over 200 pounds; but in September and October they were noticeably smaller--80 to 85 pounds. School size averaged nearly 18 tons; the smallest schools were less than a ton and contained very few large (300-530 pounds) fish; the largest school was 71 tons of 180-pound fish. Most catches were landed fresh daily, but occasional small catches were held over in ice for 1 or 2 days. The use of spotter aircraft, started in 1959 to locate tuna concentrations, was continued in 1961; planes seldom were used to set the seine around tuna schools.

ATLANTIC COAST EXPANSION, 1962-63

What had been a New England effort, by virtue of the fishery centered in Cape Cod Bay for 4 years, expanded in 1962 to become an Atlantic Coast tuna fishery. Several notable events mark the metamorphosis of the fledgling fishery to major industry stature.

¹During the winter of 1963 the Silver Mink also converted to scallop dragging in Cape Cod Bay waters.

Table 3 - Distribution of Tuna Purse-Seine Catch and Effort by Area and Month, 1958-63 ^{1/}							
Year	Area ^{2/}	June	July	Aug.	Sept.	Oct.	Total
A - Catch							
		.....(Tons).....					
		Bluefin Tuna					
1963 ^{3/}	4	-	48	-	-	-	-
	5	625	790	-	-	-	-
1962	1	-	-	-	185	-	185
	2	-	116	501	146	166	929
	3	-	-	215	1,047	36	1,298
	4	4	245	718	-	-	967
	5	-	-	-	-	-	-
1961	2	-	51	462	360	159	1,032
1960	2	-	-	207	131	-	338
1959	2	-	-	517	240	-	757
1958	2	-	3	75	107	-	185
	3	-	-	-	-	-	-
	4	-	-	-	-	-	-
		Skipjack					
1963 ^{3/}	4	-	66	-	-	-	-
	5	-	38	-	-	-	-
1962	4	-	108	371	-	-	479
B - Effort							
		.....(Days Fished - All Vessels).....					
1963 ^{3/}	2	-	9	-	-	-	-
	4	1	50	-	-	-	-
	5	7	68	-	-	-	-
1962	1	-	-	1	16	-	17
	2	1	30	63	48	38	180
	3	-	-	7	54	10	71
	4	6	55	56	-	-	117
	5	-	2	-	-	-	2
1961	2	-	9	30	38	19	96
1960	2	-	-	11	11	-	22
1959	2	-	-	17	14	-	31
1958	2	-	3	8	13	3	27
	3	-	-	1	1	-	2
	4	-	-	3	-	-	3

^{1/}Source: Logbooks and interviews.

^{2/}Areas shown in figure 1.

^{3/}1963 data are preliminary; data not available for August-October.

SKIPJACK: A most important development was the discovery of sizable commercial quantities of a second tuna species, skipjack (*Euthynnus pelamis*), in the Northwest Atlantic (tables 1 and 3). A series of 17 successful sets between July 30 and August 26, 1962, was the first indication that commercial quantities of skipjack existed in that area. A 479-ton catch was taken 30 miles south of Long Island and Martha's Vineyard (area 4) in surface water temperatures of 69° to 78° F. The two West Coast vessels making the catch had a relatively high average catch of 28.17 tons per successful set (Bureau of Commercial Fisheries 1963).

Available records for 1963 indicated that skipjack were on the Continental Shelf off Cape May, N.J., by mid-July and as far north as the Block Island area by the end of the month. Large fish (10 to 15 pounds) were followed by smaller and medium-size individuals (5 to 10

Table 4 - Classification of Purse-Seine Vessels in the Atlantic Coast Tuna Fishery ^{1/}							
Class	Capacity	Number of Vessels Operating by Year					
		2/ 1963	1962	1961	1960	1959	1958
	Tons						
1	0-50	1	1	1	1	1	1
2	51-100	4	2	1	-	-	-
3	101-200	4	2	-	-	-	-
4	201-300	3	1	-	-	-	-
5	301-400	1	1	-	-	-	-
6	Over 400	5	-	-	-	-	-
Total Vessels		18	7	2	1	1	1

^{1/}Classification is that used by the Inter-American Tropical Tuna Commission

^{2/}Data for 1963 include 2 Canadian vessels of 100-ton capacity each.

pounds) and often were mixed with bluefin tuna schools. When surface temperatures reached 78° F. off Long Island, about August 9, the catches declined and did not recover until temperatures dropped to 72° F. on August 28. From August 31 to September 3, skipjack schools, according to reports by fishermen, covered an area of 60-miles square, 40 miles south of Long Island. One airborne observer counted from one position 40 skipjack schools of 200 tons or more each. Surface temperatures were 67° to 70° F. Sizes were between 5 and 10 pounds.

Records for 4 vessels in July, 8 vessels in August, and 2 vessels in September indicate that the catch per successful set increased markedly until September 9 when the fish left the area. The average catch in July of skipjack (not mixed with bluefin tuna) was 4.1 tons per successful set (7 sets). In August the catch rate rose to 13.3 tons per successful set (49 sets), and in September ended at 34.4 tons per successful set (7 sets).

VESSELS: In 1962, the two small New England purse-seine vessels were joined by 3 medium seiners from the West Coast (two of which were purchased by East Coast interests and two large seiners from West Africa owned by a West Coast tuna canner). The following year the fleet increased to 16 United States vessels and 2 new Canadian purse seiners (table 4). Total capacity of the Atlantic Coast fleet reached 5,525 tons in 1963, five times that of the previous year (table 1). Addition of large-capacity vessels permitted fewer trips at greater distances from landing ports and provided more fishing time in the course of a season.

Several vessels with capacities of more than 400 tons made single trips and landed their catches at Puerto Rico.

Before 1962, the fishing area was restricted to Cape Cod Bay and adjacent waters. This restriction was based primarily on limitations of the small vessels. Their nets were rigged for shoal-water fishing, generally 20 fathoms or less, and were used occasionally in waters as deep as 30 fathoms. In 1962, with the arrival of larger vessels, the fishery was quickly expanded as these vessels explored a wider area and found better fishing than that in Cape Cod Bay. They were able to withstand heavier seas while pursing and brailing and could fish greater depths with their larger nets. Conversely, they had difficulty in fishing Cape Cod Bay waters without reducing the depth of the nets.

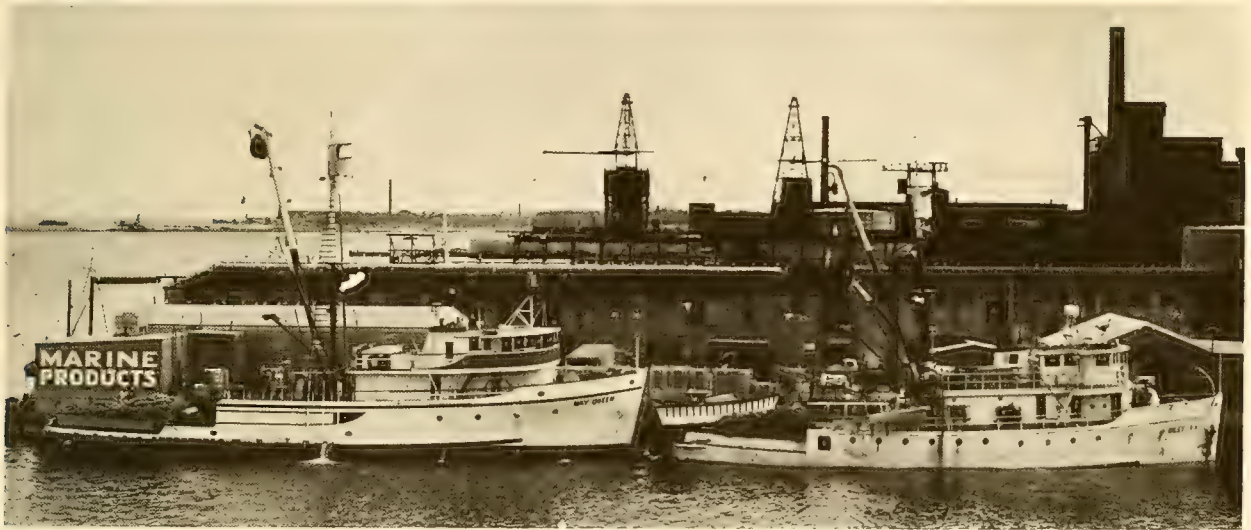


Fig. 3 - Two West-Coast tuna purse seiners, May Queen and Wiley, V.A., at New Bedford, Mass., for unloading during the 1963 season.

The size of the vessels and gear tended to divide vessel classes into two groups, each having greater efficiency in separate fishing areas. Class 1 and 2 vessels (table 4) comprised the group of small seiners which generally worked in Cape Cod Bay and occasionally fished successfully south of Martha's Vineyard during moderate weather. Class 4, 5, and 6 vessels fished outside of Cape Cod Bay for most of the 1962 and 1963 seasons. Class 3 seiners were in a unique position, being able to fish in all areas, with the exception of deep-water areas in rough weather. One of those vessels made a remarkable total catch, in excess of 1,000 tons of bluefin and skipjack, during 105 days of the 1963 season.

The Pollock Rip area east of Cape Cod (Area 3) was highly productive of bluefin tuna between August and October 1962, and the results there clearly illustrate the relative efficiencies of the vessel classes fishing in less protected waters. The catch rates and days fished for vessel classes 1 to 5, respectively, were as follows: 1.1, 3.6, 18.6, 20.0, and 38.9 tons per fishing day in 6, 8, 22, 26, and 9 days of fishing.

FISHING SEASON AND AREA: The fishing season started earlier during the latter part of June 1962 and 1963, and ended later, at the end of October 1963 (table 3). This was 5 weeks more than the 1961 season and nearly 8 weeks longer than in 1958.

The fishing area expanded from Cape Cod Bay in 1962 north to Platts Bank, east to the waters off Pollock Rip, and south to the waters off Long Island and New Jersey (fig. 1). During 1963 the area extended south to Cape Hatteras and included waters off the Middle Atlantic States to the 100-fathom curve. The additional numbers and greater capabilities of the vessels contributed to the expansion, but equal credit is attributed to the use of spotter aircraft

in scouting new fishing areas before, during, and at the end of the tuna fishing season. Aerial surveillance of the Cape May-Norfolk region (Area 5) in June 1963 located an early body of bluefin tuna in an area that was not fished the previous year.

Bluefin tuna generally frequent Cape Cod Bay on an average of 5 months a year, whether they arrive early (May) or late (July). This may be true in other areas where the season begins or ends earlier or later than in Cape Cod Bay, although not enough fishing has been done to clearly show seasonal patterns. Extended fishing time has been the result of shifting the fishing effort to the south where bluefin tuna have been available a month earlier (table 3).

The season and area for bluefin and skipjack availability are difficult to project from one year to the next on the basis of current knowledge and fishing experience. Seasonal availability patterns have been observed for skipjack in Areas 4 and 5 during the past 2 years, but nothing is known prior to that time. Whether this abundance is normal or temporary remains to be seen. Bluefin tuna are notorious for their unpredictable availability in certain areas of the Gulf of Maine. As an example, the disappearance of the fish from the Wedgeport, Nova Scotia, region completely disrupted the annual International Tuna Tournament competition for several years. In 1962, the Pollock Rip area east of Cape Cod yielded nearly 1,300 tons of bluefin from purse-seine operations between late August and early October. In 1963, constant aerial observation of those waters in the same period detected few bluefin concentrations.

FISHING EFFORT: During 1962 and 1963 the purse-seine effort for Atlantic Coast tuna jumped ahead at a prodigious rate. The number of fishing days not only increased, but the average value of the fishing day changed with the increase in average size of the purse seiners and their gear (tables 3B and 4). Experienced captains and crews have accompanied the influx of vessels from Puerto Rico and the West Coast. Less vessel time is needed away from the fishing grounds to unload catches, and operations now are possible under less moderate weather conditions. Aerial scouting, plus the vessels added to the fleet, have reduced time used in looking for tuna schools in the expanded area. Spotter plane selection of accessible schools of adequate-sized fish has reduced lost time resulting from unsuccessful sets. Also, much of the setting now is directed from the plane. Finally, the use of loran navigation systems available on the Atlantic Coast has made possible precise positioning of schools, planes, and vessels.

PROCESSING: More tuna canneries have started operations on the Atlantic Coast to handle the tuna. In 1962, a large Pacific coast salmon and tuna packing corporation established a subsidiary production center at Cambridge, Md. (Pacific Fisherman 1962). The three-line plant, with supporting cold storage for 7,500 tons of frozen fish, is one of the largest tuna canning facilities on the Atlantic Coast. A second Maryland cannery, which has canned imported raw tuna since 1958, began processing Atlantic Coast tuna during 1963. Although much of the supply is imported Japanese-caught Atlantic tuna, an increasing quantity of domestic-caught tuna was processed in 1963 (table 5). Four large canneries now operate in Puerto Rico and, as their requirements increase, Atlantic Coast-caught tuna is supplementing Pacific and foreign supplies.

Table 5 - Canned Tuna Pack by Areas, United States and Possessions, 1961-63 ¹			
Area	1963	1962	1961
	(1,000 Std. Cases-- (48 No. $\frac{1}{2}$ Tuna Cans Per Case)		
California	9,064	10,511	10,546
Washington and Oregon . .	1,449	1,471	1,262
Atlantic Coast	839	765	$\frac{3}{2}$
Puerto Rico	3,464	$\frac{2}{2}$	$\frac{3}{3}$
American Samoa and Hawaii	1,439	$\frac{2}{4}, 271$	$\frac{3}{3}, 960$
Total	16,255	17,018	15,768
¹ /Preliminary.			
² /Puerto Rican pack included with American Samoa and Hawaii in 1962.			
³ /Atlantic Coast and Puerto Rican pack included with American Samoa and Hawaii in 1961.			
Source: "Fishery Products Report", Fishery Market News Service, San Pedro, Calif., and <u>Fishery Statistics of the United States</u> , 1961.			

UNLOADING AND TRANSPORTATION: Changes in handling and disposition of the catch have reflected problems brought on by the rapid development in the past 2 years. The larger vessels with modern refrigeration ability landed catches at six additional Atlantic Coast ports in 1962 and 1963 (table 6). Several trips were unloaded directly at Puerto Rican canneries. Canadian catches were landed in Canada and transhipped to Eastport, Maine, for processing. Shipments of frozen tuna from New Bedford

Table 6 - East Coast Tuna Landings by Port and Species, 1962-63^{1/}

Port	1963					1962			
	Trips	Bluefin	Skipjack	Unclass.	Total	Trips	Bluefin	Skipjack	Total
(Short Tons)									
New England:									
Eastport, Maine	2	100	121	210	431	-	-	-	-
Sagamore, Mass.	48	1,002	82	-	1,084	50	684	-	684
Provincetown Mass.	27	405	-	-	405	13	229	2/	230
New Bedford, Mass.	24	646	354	635	1,635	34	1,431	380	1,811
Providence, R. I.	4	336	317	-	653	3	495	90	585
New England Total	105	2,489	874	845	4,208	100	2,839	470	3,310
Mid-Atlantic:									
Jersey City, N.J.	2	758	-	-	758	-	-	-	-
Cape May, N.J.	5	-	-	791	791	-	-	-	-
Cambridge, Md.	3	286	185	-	471	-	-	-	-
Mid-Atlantic Total	10	1,044	185	791	2,020	-	-	-	-
Grand Total	115	3,533	1,059	1,636	6,228	100	2,839	470	3,310

^{1/}Preliminary, does not include Pacific yellowfin and skipjack landed on the Atlantic Coast in 1963.

^{2/}Less than a ton.

Source: Fishery Market News Service, Boston, Mass.

ford to Puerto Rico by "Sea-Land" trailers enabled some vessels to continue fishing during the peak of the season. Several hundred tons of the larger bluefin tuna were exported to the Italian market. Most of the tuna required transportation from dockside to canneries or storage facilities, and this need posed a major problem to the growing industry. The costs, borne by the vessels in most cases, tended to offset the profits made during a short season.

PRELIMINARY SCIENTIFIC FINDINGS

Since the start of continued purse-seine fishing for bluefin tuna in Cape Cod Bay in 1958, the U. S. Bureau of Commercial Fisheries has collected records of catch and effort that pertain to abundance and availability of tuna off the Atlantic Coast of the United States. In collaboration with the Woods Hole Oceanographic Institution, the Bureau initiated in 1962 a tuna purse-seine logbook system, similar to that used by the Inter-American Tropical Tuna Commission in the Pacific.

It is too early to determine any real effects of fishing on tuna abundance because the fishery has not been stabilized in any one area for a sufficient period of time. Preliminary information from collected data indicates a normal change in the catch rate per fishing day for a new fishery using an undeveloped resource (tables 1 and 7). Very little information is available on the relative abundance or availability of either bluefin or skipjack during those years. Fluctuation in these factors could certainly have had considerable effect on the catch per day's fishing.

The Woods Hole Oceanographic Institution has tagged tuna in the Northwest Atlantic since 1954. About 1,500 tagged bluefin tuna had been released by December 1963. Of 32 recaptures, 25 were taken in Continental Shelf waters from Maryland to Massachusetts. Although the numbers have been small, a significant increase in returns was noted: from 6 recoveries between 1954 and 1962 to 19 in 1963 alone (Mather 1963).

Tag recoveries by tuna purse-seine vessels suggest that in 1963 a group of bluefin tuna in the 100-pound class moved west southwest from Oceanographer Canyon (fig. 1) to coastal waters off Ocean City, Md. (Area 5), then northward and eastward to off Block Island (Area 4), and finally into the Cape Cod Bay area (Area 2); while smaller individuals moved from off Long Island (Area 4) eastward toward Martha's Vineyard (Area 4) and then west again (F. J.

Table 7 - Atlantic Coast Tuna Purse-Seine Catch Per Day Fished, 1958-62^{1/}

Year	Area ^{2/}					East Coast
	1	2	3	4	5	
	. . . . . (Tons Per Day Fished--All Vessels)					
1962	10.9	5.1	18.2	8.3	0	10.0
1961	-	10.8	-	-	-	10.8
1960	-	15.4	-	-	-	15.4
1959	-	24.4	-	-	-	24.4
1958	-	6.9	0	0	-	5.8

1/Data based on logbooks and interviews; for breakdown of days fished in each area, see table 3B.

2/Areas are shown in fig. 1.

^{1/}Data based on logbooks and interviews; for breakdown of days fished in each area, see table 3B.

^{2/}Areas are shown in fig. 1.

Mather III personal communication). With the exception of bluefin tuna tagged during exploratory long-line cruises farther offshore, most of the marked fish recovered in the 1963 seine fishery were released by cooperating sport fishermen in the seining area since 1960.

Other interesting bluefin tuna tag recoveries are two fish released off Martha's Vineyard in 1954 and caught in the Bay of Biscay in 1959 (Mather 1960), and 5 fish released from Cat Cay, Bahamas, from 1960 to 1962 and taken in tuna purse seine catches off Norway during 1961 and 1962. One of those fish, tagged June 15, 1962, was recaptured August 4, 1962, off Bergen, Norway--a trans-Atlantic crossing of 50 days (Mather 1962b, 1963).

Although these data are fragmentary and subject to the possibilities of chance, they do indicate a need for further investigation and evaluation of the tuna resources of the Northwest Atlantic if we are to determine their commercial potential. Continued observations through exploratory sampling, tagging, and logbook analysis should provide further insight into the distribution, abundance, and movement of the several tuna species known to frequent waters off the Atlantic Coast of the United States.

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HOW TUNA SEE A NET

By Frank Hester* and John H. Taylor**

ABSTRACT

The horizontal sighting range of a submerged object in the sea is physically determined by the attenuation and scattering of light over the path of sight and by the contrast of the object with the underwater background. The former is a measurable quantity α which varies with locality in the sea. The latter is determined by the shape and reflective characteristics of the target and by the underwater lighting geometry. In this paper these principles are applied to determine and control the underwater sighting range of tuna seines.

Records of tuna seining operations kept by the California tuna fleet over the past dozen years show that more successful sets are made either in turbid water or at night. It looks as though the success of seining operations is limited in part by the fact that in clear water the fish see the net in time to avoid it. Because of this, we have become interested in finding out how a net is seen by tuna. In this article, we will discuss our preliminary findings, including methods for making nets less visible. Also, an understanding of light in the sea can lead to an improvement in seining strategy which might improve the success of the seining operation even using existing nets.

The visibility of objects under water by humans has been studied intensively for the last decade by the Visibility Laboratory of Scripps Institution of Oceanography of the University of California under the direction of Dr. S. Q. Duntley. Much of the information obtained can be applied directly to our problem. For this reason, a cooperative program has been begun between the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, and the Visibility Laboratory, which will extend this knowledge to help us find out how tuna see a net.

The similarity between our problem of tuna seeing a net and visibility by a human observer is plain. However, our problem is complicated in that we can not yet compare the visual ability of a tuna with that of a human swimmer. Also, previous studies have dealt with the visibility of solid objects, whereas, nets have special properties which we have yet to evaluate. Nevertheless, one can apply the results of the previous experiments with humans and solid objects to tuna and nets and come up with some answers. We can make a good guess as to how the distance at which tuna can see nets varies in different fishing grounds. We can predict how this sighting range will change with sun elevation or time of day and cloud cover. And, finally, we can use this information to point out ways to change the visibility of nets.

Sighting range depends on the distribution of the light field under water, the clarity of the water, the nature or type of object we wish to sight, its position in relation to the observer, and the ability of the observer to see. To predict the sighting ranges of submerged objects we should first learn something about the behavior of light under water.

Those of you who have been under water to free a bait net or clear a propeller will recall that light beneath the surface rapidly becomes dimmer with depth; that the brightness of the water background changes with the path of sight, being brightest when looking towards the surface; and that, even in clear water, objects at a distance seem to blur, their outlines becoming less and less distinct as the distance increases.

The rapid dimming of light as one goes deeper is caused by the absorption of light by sea water. This absorption is greatly increased by dissolved material such as one finds near shore and by the very small plants and animals that grow in the sea and often discolor the water. But, even in the very clearest offshore water, light is rapidly absorbed so that, no matter where one is in the sea, this loss of daylight with depth holds true.

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Absorption of light by sea water, however, is not nearly so important to our problem as is the scattering of light by small suspended particles in the water. Just as the beam of a spotlight or the headlights on a car are reflected back or scattered by fog or dust in the air, so is sunlight scattered by the very small (living and dead) plants and animals and the inorganic material such as sand and silt that are present in the sea. Figure 1 shows how a beam of collimated light, that is, light with parallel rays, is scattered. Most of the beam continues in its direction of travel but some of the light is reflected back and some is scattered in other directions.

Scattering of light in the sea is very important also in determining the distance at which objects can no longer be distinguished from the underwater background. In fact, scattering is so important that a special instrument has been designed to measure it. This instrument shines a collimated light beam through a known amount of water, usually 1 meter, to a photocell receiver. This receiver is similar in principal to a photographic light meter. By knowing the amount of light at the source and the amount reaching the receiver, the loss of light energy over the known distance between source and receiver can be calculated. This loss is proportional to the loss due to absorption and scattering over that distance. This loss is by custom referred to by the Greek letter alpha (α). The dimensions of alpha can be natural log units per meter or, in our case, per foot ($\frac{\ln}{ft}$). A quantity like this is difficult to visualize so frequently the value of ($\frac{1}{\alpha}$) is used. This value is called the attenuation length and expresses the distance of water required to reduce the brightness of our light to about its original brightness. For example, alpha in figure 3 is 0.05 ($\frac{\ln}{ft}$). Attenuation length ($\frac{1}{\alpha}$) then would be 20 feet. This means that if we separated the light from the receiver in our alpha meter by 20 feet the receiver would show that the light was about $\frac{1}{3}$ its original brightness.

Attenuation length is a measure of water clarity. Short attenuation lengths (large values of alpha) are associated with dirty, turbid nearshore water, whereas, long attenuation lengths (small values of alpha) are usually found offshore. The table gives some values of alpha at attenuation length measured in the Pacific Ocean.

A surprisingly large number of objects can be seen about four times the attenuation length under water. This is, of course, an approximation and requires certain conditions to prevail. For most dark objects this approximation is very useful in predicting, once alpha has been measured, the underwater sighting range.

If we now combine the two properties of sea water we have discussed, namely, absorption and scattering, a very interesting feature of the underwater light field becomes apparent. Previously, we noted that the brightness of the water background changes, depending on our path of sight. This is because, as the collimated rays of the sun enter the water, some are scattered and some continue in the original direction of travel. All the rays, however, are subject to steady weakening from absorption. Near the surface and looking up, there will be a bright spot corresponding to the position of the sun. As one goes deeper, this bright spot will tend to become less distinct due to scattering.

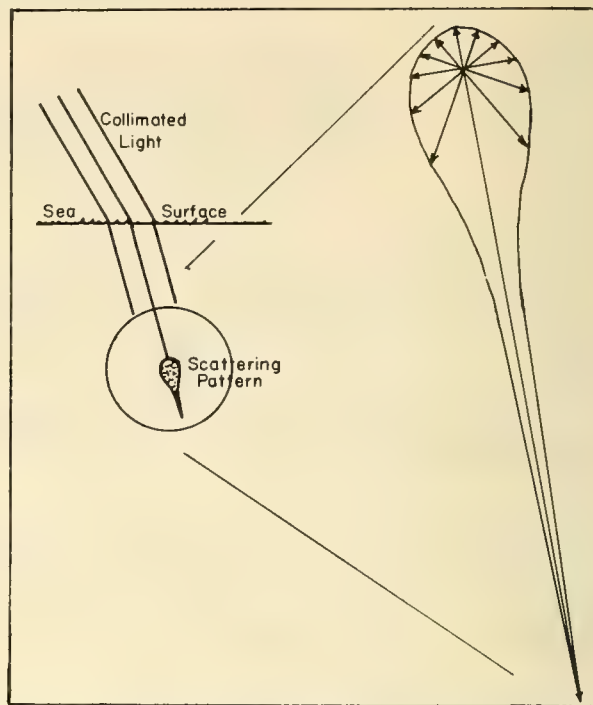


Fig. 1 - Diagrammatic representation of the scattering of collimated light by sea water. The length of the arrows in the enlarged picture at the right represents the amount of light being scattered in each direction. By far the greatest amount of light continues in the original direction.

Surface Values of Alpha (α) and Attenuation Length ($\frac{1}{\alpha}$) at Various Locations in the Pacific Ocean (The horizontal sighting ranges for many objects in the sea by human observers are about four times the attenuation length. Sighting ranges of tuna nets vary between 3 and $3\frac{1}{2}$ times the attenuation length.)		
Location	α ($\frac{1}{\text{ft.}}$)	Attenuation Length in ft. ($\frac{1}{\alpha}$)
San Diego Bay (May 1964)	0.70	1.43
La Jolla (April 1964)	0.18	5.56
Catalina Island (August 1963) (June 1964)	0.06 0.16	16.70 6.25
Morgan Bank (February 1962)	0.12	8.33
Socorro Island (February 1962)	0.05	20.00
Mexico - off Acapulco (February 1962)	0.04	25.00
Costa Rica Inshore (July 1962) Offshore (July 1962)	0.26 0.05	3.84 20.00
Hawaii (April 1964)	0.03	34.20

Also, those rays traveling at an angle will have to go farther than those which are scattered straight down and, therefore, they will have been subject to absorption by the water for a longer distance by the time they reach the same depth than the light scattered straight down. At some depth, then, the rays travelling the longer distance will have been absorbed to the point where they are not so strong as the light traveling straight down and the brightest spot in the underwater field will have moved until it is directly overhead. The rest of the light field becomes gradually darker as the path of sight changes from directly overhead to straight down. That this would occur was first proposed over 30 years ago and, in 1960, John E. Tyler of the Visibility Laboratory of the University of California, experimentally demonstrated that this actually does happen. Depending on the amount of scattering and absorption, the depth at which this occurs will vary from a few feet in very dirty water to several hundred feet in very clear water.

We can picture the shape of the underwater light field as approximating an egg. If the observer is inside this egg, the distance from the observer to the shell can represent the brightness of the background for any particular path of sight. The greater the distance to the shell, the brighter the background. On overcast days at all depths, and on sunny days with a zenith sun, or below the depth we just discussed, the brightest area or greatest distance to the shell will be overhead at the zenith and the darkest area will be straight down at the nadir (fig. 2 (a)). The dimensions of the egg will change with depth as will the degree to which it is tipped from the vertical. If we cut the egg with a horizontal plane, we find that the brightness of the background looking in any direction is as represented in figure 2 (c), being a circle in the first case where the egg is upright and an ellipse in the second case where the egg is tipped.

The ability of a human being to distinguish from its background has been the subject of numerous experiments and observations. We are, of course, dealing with a fish, not a man; as noted earlier, we do not know yet how well a fish can see under water. Our problem, however, deals primarily with the ability to distinguish contrasts, that is, to detect differences in brightness, and in this ability, fish and humans are probably more nearly alike than they are in other respects. We will assume for the moment that fish and man detect contrast about the same so that we may come up with some estimates of net-sighting ranges.

Seeing an object means that in some way we can detect a difference between the amount or kind of light energy coming from

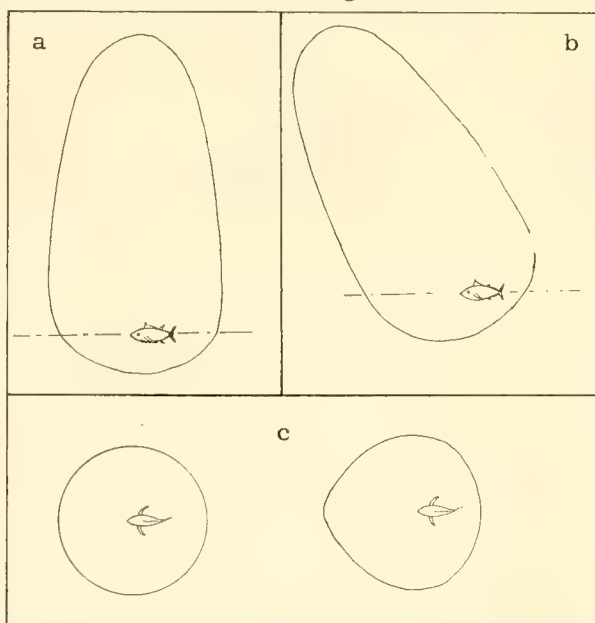


Fig. 2 - A typical shape of the under water light field. The greater the distance from the eye of the fish to the side of the egg the brighter the background for that path of sight. (a) represents the shape on overcast days or for a zenith sun. (b) represents the shape on cloudless days when the sun is not overhead. (c) shows the shape of the field on the horizontal planes indicated by the dotted lines in (a) and (b).

various parts of the object and that coming from its background. Under water, where colors rapidly disappear leaving only blues and greens, we are more interested in the difference in intensity rather than color of light energy. We call the difference between the object and its background its contrast. We can assign numbers to contrast by defining it as the brightness of the object, this is, the amount of light being received from the object, minus the brightness of the background, all divided by the brightness of the background. Or, if we call the object brightness B_t and the background brightness B_o , then contrast $C = \frac{B_t - B_o}{B_o}$. From this, you can see that contrast can assume values ranging from minus one (when the object reflects no light at all and the background does reflect light) to some very large positive number when the object reflects a great deal of light and the background does not. In other words, contrast is negative when the object is darker than its background and positive when the object is lighter than its background. Experiments with humans show that objects whose contrasts are equal numerically are seen equally well whether the sign of the contrast is positive or negative. This is to say that even a perfectly black object (contrast -1) will have the same sighting range as a light object with a contrast of +1. (The light object being, therefore, twice as bright as the background.) Since light objects are often several times brighter than their background, they are usually more visible than dark ones.

When both the object and its background are equally bright, contrast is zero and the object is invisible. Actually, with the human and probably the fish, contrast does not have to be zero but only close to zero for an object to be invisible.

Of the many useful observations which have come out of the Visibility Laboratory, perhaps the one which relates changes in contrast to alpha is most important for our problem.

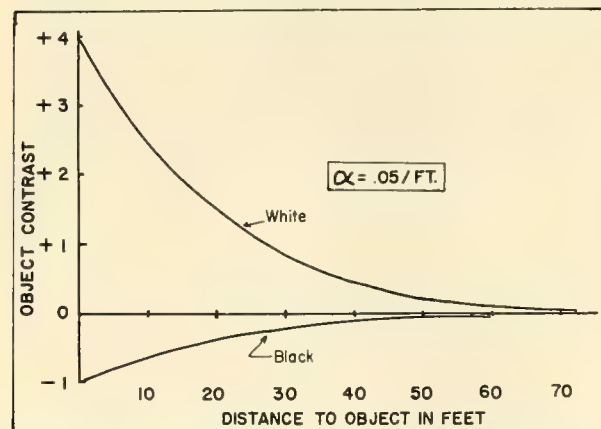


Fig. 3 - Change in contrast with distance for two objects, one with a high reflectance (white) and one with a low reflectance (black). Notice that at the distance where the black object's contrast is nearly zero the white object's contrast still differs markedly from zero.

Their experiments have shown that, for horizontal paths of sight, the contrast between an object and its water background diminishes exponentially with distance. This change in contrast with distance is shown for a black target and a white target in figure 3. As long as we know three things: The brightness of the target, the brightness of the water background, and alpha, we can calculate the distance at which it will no longer be visible (insufficient contrast for seeing), assuming that we are looking horizontally, that the target is bigger than a certain size, and there is sufficient light. Equally interesting, we can work backward and calculate the brightness an object must have at some specified distance so that it will be invisible against a given background.

The preceding strictly applies only to solid objects above a certain minimum size.

To date, there has been no attempt to discover

how the visual characteristics of a net differ from those of a solid object. We have made a number of measurements using actual nylon net samples to show how sighting distance changes with water clarity. Our measurements agree in general with what we would predict for a solid object of the same average contrast. However, we find that a net with the meshes open is visible by man for a shorter distance than if it is bunched up so that it appears to be solid. For example, open-meshed, the net can be seen horizontally 102 feet away in the clear water off Hawaii while, with the meshes closed, it can be seen 138 feet away. Similar measurements made off San Diego showed that, open, the meshes could be seen 36 feet and, closed, 41 feet away.

If the underwater light field is as in figure 2 (a) so that the background brightness does not change with azimuth, we would expect the sighting range to be the same regardless of the

azimuth of the path of sight. We have seen, however, that on sunny days near the surface, the background brightness does change with azimuth and that the water is brighter in the direction of the sun and darker looking away. As long as the object we are considering has such a low reflectance (looks black) that it is always much darker than the background, its contrast will always be close to minus one and the sighting range will not change greatly with azimuth. This is shown in figure 4 by the curve labeled "net" and corresponds to a newly tarred nylon net with its meshes tightly bunched. The other curve represents the sighting range of a flat white surface that reflects 91 percent of the light falling upon it. This surface is held vertically in the water with its flat side directed toward the observer. You will notice that when viewed in the direction of the sun its contrast is also negative. As its azimuth changes, its surface becomes brighter until its contrast reaches zero at a relative bearing of about 25° . From this point on it becomes brighter and brighter, its contrast now being positive, until, at 90° , it has as great a positive contrast with the background as the dark net does a negative. At this point, the sighting range of the net and the white target should be the same.

Between 90° and 180° , the contrast of the white object becomes increasingly positive and the sighting distance exceeds 60 feet. The net curve under the same condition only shows a change of 1 foot between the two extreme positions. This experiment was done off San Diego in April 1964. Had this experiment been done in Hawaiian waters in April, the white surface would have been visible over 215 feet instead of only 60 feet. Generally it is true that light-colored objects such as purse rings, galvanized chain, and especially white nylon line, are much more visible under water than dark objects.

So far, we have shown that the visibility of an object under water during the day is dependent on its contrast with the background. This is affected by sun elevation, cloud cover, and depth. The distance over which it can be seen is controlled by the water clarity as measured by alpha. This knowledge now can be applied to tuna seining. To do this, we will assume that the way to increase the rate of success is to make the net as inconspicuous as possible. Since the rate of success is fairly high in murky water, we will concern ourselves with clear, offshore waters. Two courses are open to us: we can make the net nearly invisible by matching its contrast to that of the water background or we can make it of transparent material. This second choice may, in the future, prove to be part of the answer to catching skipjack in clear water. However, it is unlikely that existing multi-thousand dollar nets will be abandoned immediately, so we will confine ourselves to considering ways of decreasing the visibility of the nets presently used in the fishery.

The basic idea of camouflage is to hide an object by making it look like something else, often the background. In the case of a tuna seine, there is nothing else to look like but the

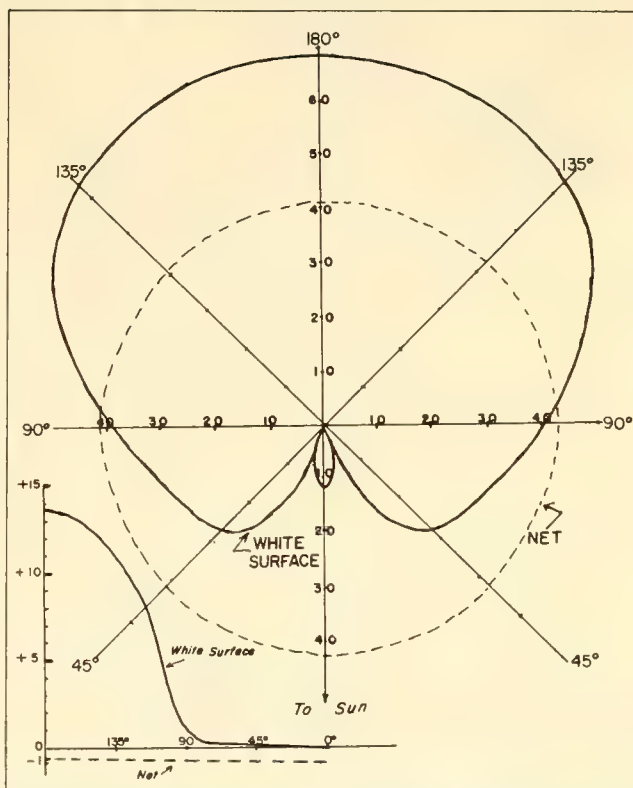


Fig. 4 - Changes in horizontal sighting range for a net sample (meshes bunched) and a white surface (91 percent reflectance submerged) with changes in azimuth. This experiment was made off La Jolla Calif. Sun elevation angle was 58° , α was 0.08/ft. Depth was 30 ft. Changes in contrast for the two samples at a distance of 3 ft. from the observer are plotted at the lower left. Notice the small variability for the net and the large variability for the white surface (from a slight negative contrast when seen between the observer and the sun to almost +14 when the sun is behind the observer).

background. We want the brightness of the net to match the background brightness as nearly as possible for any path of sight. Since the brightness of the background varies, as we have seen, along different paths of sight, we would have to darken and lighten various portions of the net to match. This, in itself, of course, would not be enough for we would have to make sure that, in setting the net, the lightest portion was between the fish and the sun and the darkest portion on the side of the fish away from the sun. Laying out the net in this manner is not always practical nor is the underwater light field always the same so we cannot hope for a perfect match except under rare conditions.

Another approach would be to pick a net treatment that would result in a negative contrast between the net and the background regardless of the path of sight. Actually, this is what dark nets have now and, since their contrast can never exceed minus one or be greater than zero, they must always be less conspicuous than a light-colored net whose contrast can exceed plus one. Our observations show that existing nets are too dark for them to have minimal visibility but, as noted above, it is better to have too dark a net than too light a net.

Following the same reasoning, then, the most conspicuous parts of the net are the white nylon line often used for the zipper and the galvanized chain and rings. The contrast of the white nylon to the water can be very great and the rings and chain are not far behind. These latter are particularly poor parts to have stand out since they tend to outline the only avenue of escape open for the fish. In fact, during the last few minutes of pursing, the rings and chain outline a big hole for the fish to see. This effect could be reduced by darkening the rings and chain with flat black paint. A similar reduction in contrast could be obtained, as shown in figure 4, by keeping the vessel between the sun and the net.

Reducing the visibility of fishing gear to improve success is nothing new. Trout fishermen have been trying to do it for several centuries, net fishermen for a lesser time. Fortunately, most natural preservatives are dark and this is beneficial. Today, with the introduction of synthetics, net camouflage becomes practical. Monofilament has certainly increased the efficiency of high seas gill-netting. Since vision is perhaps the most important sense to tuna, it follows that a similar increase in success is possible for the tuna fishery if the proper means of visual deception are employed.



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, DECEMBER 1964:

U.S.S.R.: The Soviet trawling fleet fishing in the vicinity of Yakutat Bay continued operations through December. It was the first time the Soviets have maintained a fishing fleet in the Gulf of Alaska during the winter. Weather conditions were severe, but they appeared to be fishing for Pacific ocean perch, with little or no catch of incidental species. About 15 vessels were reported in the area during December.

It was reported the Soviets had resumed an extensive herring fishery in the Bering Sea northwest of the Pribilof Islands. In past years this "winter" fishery has involved a fleet of more than 200 Soviet vessels.

Japan: The Japanese shrimp factoryship Chichibu Maru accompanied by 10 trawlers terminated fishing and returned to Japan during the month, according to Japanese sources. That fleet operated in the shrimp fishery mostly in the eastern Bering Sea throughout 1964.

Two large new stern trawlers, the Taiyo Maru No. 82 and the Akebono Maru No. 72, were reported in the eastern Bering Sea during December, with another new stern trawler (Aso Maru) fishing in the vicinity of Adak in the western Aleutian Islands.

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1964 ALASKA KING CRAB CATCH AT RECORD HIGH:

Total landings of king crab in Alaska during 1964 were estimated by the Alaska Department of Fish and Game to be more than 85 million pounds as compared with the previous record of 78.7 million pounds in 1963.

Seismic sea waves and land subsidence resulting from the March 27 earthquake crippled crab processing facilities at Kodiak and

caused a decrease in the king crab catch in that area. Kodiak fishermen, however, shifted much of their efforts westward to the Alaska Peninsula-Aleutians-Bering Sea areas following the disaster and helped attain a record king crab catch of about 31.1 million pounds -- up from 13.7 million pounds in 1963.

The Kodiak area yielded 15 million pounds of king crab from July 1 to December 10, 1964,



Kodiak king crab haul showing large average size.

about 2 million pounds less than the same period in 1963. The Cook Inlet area also showed a decrease from 8.3 million pounds in 1963 to an estimated 7 million pounds in 1964.

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FISHERY LANDINGS, 1963:

Fish and shellfish landings in 1963 in the State of Alaska totaled 392.2 million pounds valued at \$45.7 million ex-vessel. Compared with 1962, this was a decline of 37 million pounds (9 percent) and \$11.5 million (20 percent) largely because of reduced landings of salmon and halibut.

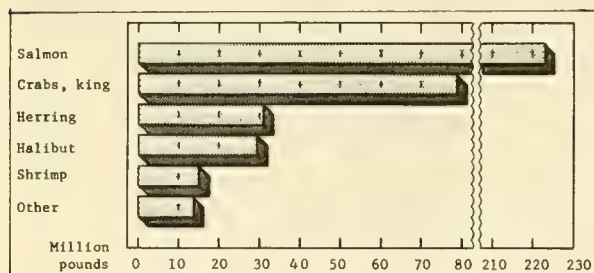


Fig. 1 - Alaska catch, 1963.

Landings of Alaska salmon in 1963 amounted to 223 million pounds--55 million pounds less than in 1962, and 504 million pounds below the record 727 million pounds in 1963. Halibut landings of 30 million pounds declined 7 million pounds (19 percent) as compared with 1962. The 1963 landings of herring (31 million pounds) and shrimp (15 million pounds) declined 2.7 and 1.8 million pounds, respectively.

The decline in 1963 was partially offset by record landings of king and Dungeness crab. King crab landings totaled nearly 79 million pounds--26 million pounds more than in 1962. Dungeness crab landings in 1963 totaled 12 million pounds--an increase of 3 million pounds (34 percent).

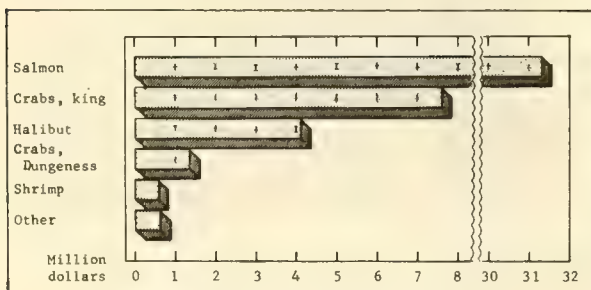


Fig. 2 - Value of Alaska catch, 1963.

Landings were taken by 17,014 fishermen--1,218 more than in 1962. Commercial fishing craft operating in 1963 consisted of 2,286 vessels of 5 net tons and over, and 7,970 motor boats.

In 1963, manufactured fishery products totaled 210 million pounds valued at \$109 million--a decline of 38 million pounds and \$23 million as compared with 1962.

The Alaska canned pack of fish and shellfish in 1963 was 3.0 million cases valued at \$76.3 million--775,000 cases and \$25.7 million less than 1962. The decline resulted chiefly from a drop in the pack of canned salmon.

* * * * *

FISHERIES HIGHLIGHTS, 1963:

The total Alaska fisheries catch in 1963 was down 9 percent in quantity and 20 percent in value from the previous year due mainly to a drop in the catch of salmon and halibut. The Alaska king crab catch increased sharply in 1963.

Salmon continued to be the major item in Alaska fisheries, accounting for 57 percent of the quantity and 68 percent of the value of the total catch in 1963. Pink salmon accounted for over half of the Alaska salmon catch in 1963. The area breakdown of the total 1963 Alaska salmon catch was 102.4 million pounds in southern Alaska, 93.3 million pounds in central Alaska, and 27.4 million pounds in western Alaska.



Unloading red salmon at a cannery in Bristol Bay.

In 1963, the Alaska halibut fishery was centered in southeastern Alaska while the developing king crab fishery was centered in central and western Alaska.

The 1963 Alaska catch was taken by 17,014 fishermen operating 2,286 fishing vessels (craft of 5 net tons and over) and 7,970 other boats.

Alaska Fisheries Catch, 1962-1963				
Species <u>Fish</u>	1963		1962	
	Quantity Pounds	Value Dollars	Quantity Pounds	Value Dollars
Halibut ^{1/}	29,886,400	4,160,990	36,791,800	7,466,520
Herring	31,216,200	468,240	33,876,400	379,320
Rockfishes ^{2/}	90,500	6,340	166,200	8,370
Sablefish	1,359,500	125,540	1,508,600	171,920
Salmon: ^{3/}				
Chinook or King	9,160,600	3,126,640	8,738,600	2,698,860
Chum or Keta	35,748,400	3,046,550	57,652,500	4,832,170
Pink	125,117,400	14,472,380	143,278,700	20,296,300
Red or Sockeye	35,455,600	7,643,860	52,946,400	11,130,170
Silver or Coho	17,581,200	3,008,820	15,231,500	3,161,960
Total Salmon	223,063,200	31,298,250	277,847,700	42,119,460
Trout:				
Dolly Varden	4,800	960	4,500	780
Lake	2,200	440	-	-
Steelhead	19,700	3,940	10,000	1,890
Whitefish	600	130	-	-
Total Fish	285,643,100	36,064,830	350,205,200	50,148,260
Shellfish, etc.				
Clam Meats, Razor.	410,300	51,950	239,900	78,670
Crabs:				
Dungeness.	12,084,100	1,357,540	8,989,500	1,001,450
King	78,740,300	7,607,360	52,782,200	5,278,210
Shrimp	15,126,900	605,080	16,943,100	731,370
Kelp (with herring eggs)	199,100	15,920	46,200	2,310
Other	-	-	11,700	1,380
Total Shellfish, etc.	106,560,700	9,637,850	79,012,600	7,093,390
Grand Total	392,203,800	45,702,680	429,217,800	57,241,650

^{1/}Includes the value of halibut livers and viscera amounting to \$6,500 in 1963 and \$2,940 in 1962.

^{2/}Includes lingcod.

^{3/}The round weights used in catch tables were obtained by multiplying number of fish by their average weight.

Note: The above data include catches of halibut, sablefish, lingcod, and rockfish landed by vessels of U. S. Registry in British Columbia ports. Round weights of fish taken by halibut vessels were obtained by multiplying reported weights, representing poundage of fish eviscerated and with heads-off, by the following factors: halibut 1.33, sablefish and rockfish 1.43.

In 1963 there were 7,907 persons engaged in wholesaling and manufacturing fishery products in Alaska. Fishery establishments in Alaska included 100 canning plants, 59 fish curing plants, and 66 plants handling fresh and frozen fishery products. Alaska's processed fishery products had a wholesale value of \$109 million in 1963.

Alaska's main canned fishery products in 1963 were 2.7 million standard cases of canned salmon valued at \$67.4 million; 271,549 standard cases of crab meat (king and dungeness) valued at \$7.6 million; and 61,949 standard cases of shrimp valued at \$1 million.

Alaska's processed frozen fishery products included principally about 27 million pounds of dressed halibut valued at about \$8 million; 13 million pounds of dressed salmon valued at about \$6 million; 16 million pounds of king and Dungeness crab products (whole crab, crab sections, and crab meat) valued at about \$12 million, and 3 million pounds of shrimp valued at about \$3 million.

The 2 million pounds of mild-cured salmon produced in Alaska in 1963 was valued at \$2 million.

Alaskan output of industrial fishery products in 1963 amounted to 2,229 short tons of herring meal valued at \$285,100 and 4.4 million pounds of herring oil valued at \$222,400. (C. F. S. No. 3691, Alaska Fisheries--1963, U. S. Bureau of Commercial Fisheries.)



Alaska Fishery Investigations

PINK SALMON FAIL TO SELECT BEST SPAWNING SITES:

Analysis of field data on the 1963 brood-year pink salmon runs in Sashin Creek shows that the spawning fish did not concentrate in areas offering highly favorable environmental conditions for survival of eggs and alevins. In 1963, emphasis was placed on relations between distribution of spawners and survival of their spawn. Spawning density in areas which demonstrated the highest survival of eggs and alevins and produced the most fry per square meter of spawning ground was no greater than in areas which showed relatively low survival, and was even less in one instance. The instantaneous mortality rate of the entire 1963

brood-year population was estimated to be about 40 times greater during the period of spawning than during the period of fry emergence and migration.

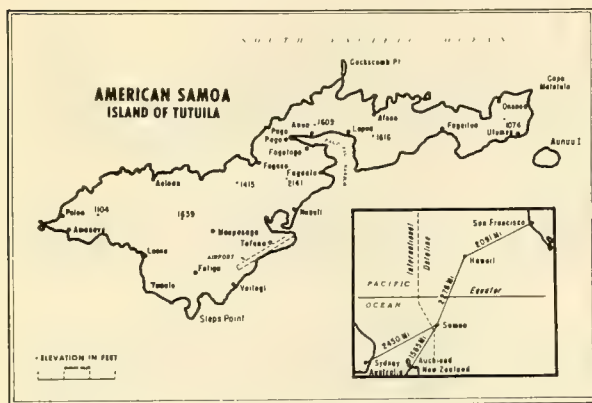
Analysis of remaining field data on 1963 brood-year pink salmon in Sashin Creek was near completion and will be followed by reports giving results of the field studies.



American Samoa

MORE TUNA VESSELS FISHING OUT OF AMERICAN SAMOA:

According to informed Japanese industry sources, the number of tuna fishing vessels



operating out of American Samoa has shown a sharp increase. As of December 31, 1964, a total of 68 vessels (40 Japanese, 17 South Korean, and 11 Formosan) were fishing for the two United States packing firms located on that Island, as compared to 54 vessels in mid-November 1964. (Suisan Keizai Shim-bun, January 10, 1965.)



California

REGULATIONS ON NET WEIGHT LABELING ADOPTED:

The California Department of Agriculture, Bureau of Weights and Measures, adopted new "Net Quantity Declarations on Packaged Commodities" regulations, which became official as of December 18, 1964. The ruling became effective on labels redesigned and

labels prepared from plates made after January 1, 1965, and on all labels after January 1966. California will require at least $\frac{1}{16}$ -inch letters and numbers on all small labels up to 25 square inches.

A requirement of the regulations is that "a secondary statement of contents, other than the required statement, is not prohibited, but shall not be placed or designed to be more conspicuous than the required statement."

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 64-A-6-Pelagic Fish (August 27-September 16, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters of central Baja California from Cedros Island to San Martin Island were to: (1) survey the fish and invertebrates of the inshore pelagic environment; (2) determine the amount of recruitment from the 1964 Pacific sardine (Sardinops caeruleus) spawning and to measure the population density of older fish; (3) determine the distribution and abundance of northern anchovies (Engraulis mordax), Pacific mackerel (Scomber diego), and jack mackerel (Trachurus symmetricus); (4) collect live anchovies for racial studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, La Jolla, Calif.; and (5) take bottom sediment cores for a study of the historical abundance of sardines and anchovies by the Scripps Institution of Oceanography.

A midwater trawl, a blanket net, and visual scouting were used to conduct the survey with all work carried out at night. A total of 41 midwater-trawl and 25 night light-blanket net stations were occupied, and 296 miles were scouted visually. Anchovies were taken on 30 stations, jack mackerel on 17, sardines on 10, and Pacific mackerel on 3. Midwater-trawl stations accounted for all but 2 anchovy, 2 sardine, and one jack mackerel catch. Other common species taken by the trawl in order of occurrence were: midshipmen (Porichthys myriaster and P. notatus), California tonguefish (Symphurus atricauda), Pacific pompano (Palometa simillima), and lizardfish (Synodus sp.).

Poor visual scouting conditions resulted in the sighting of only 16 anchovy, 2 sardine, and 7 unidentified schools. Echo-sounder

operations detected anchovies scattered continuously near the surface over a large portion of the survey area. The invertebrate catch consisted chiefly of squid which were taken on 29 trawl stations. Salps, pelagic red crabs (Pleuroncodes planipes), ctenophores, and pyrosomes were caught less frequently.

NORTHERN ANCHOVIES: Anchovies dominated the survey both in number of occurrences and in numbers caught. They were distributed over almost the entire survey area except a small portion of Sebastian Vizcaino Bay where sardines were abundant. Anchovies were numerous around Cedros Island and became increasingly abundant from Lagoon Head towards the northern limit of the survey area. They were caught in 28 of 41 trawl tows and at 2 of 25 blanket-net stations. All schools observed or detected by echo-sounder were in a thin layer but covered areas up to 5 miles across. No dense compact schools were observed or fished.

Midwater-trawl catches were mostly light, with only one-half of them containing more than 100 fish. But 10 catches exceeded 1,000 fish and 3 exceeded 30,000, with the largest catch consisting of 100,000 fish weighing 800 pounds. Juveniles ranging from 85-100 millimeters (3.3 to 3.9 inches) accounted for over 80 percent of the total catch.

Anchovy distribution and size composition closely resembled that of the survey made in 1963. Negative phototactic behavior was quite evident on night light-blanket net stations. From this and past experience, it appears that type of behavior is the anchovy's normal reaction to light in the open sea.

PACIFIC SARDINES: Sardines were scarce, and were found mainly in 2 small areas at the southern end of the region surveyed. The 1964 year-class predominated at Cedros Island, where small pure schools of 108- to 126-millimeter (4.3 to 5.0-inch) sardines were present. Several smaller fish were taken mixed with large quantities of anchovies in the same vicinity. The blanket net and midwater trawl each accounted for 2 sardine samples. Adult fish were caught in a small area in the south end of Sebastian Vizcaino Bay. Six midwater-trawl catches were made in that area.

During the 1963 survey, sardines were much more abundant and distributed over the entire survey area. The 1964 year-class ap-

pears to be weak in central Baja California; this may be due to a southward shift of the sardine population. The eastern shore of Vizcaino Bay, which in former years produced the best survey catches, was almost entirely devoid of fish. Unseasonably cool water temperatures, averaging nearly 8° F. below normal, may have caused the sardines to move southward.

JACK MACKEREL: Small juvenile jack mackerel were caught at scattered locations throughout the survey area. Catches were small, ranging from 1 to 120 fish. The trawl took 16 samples and the blanket net 1. All but one sample was composed of fish-of-the-year. No schools were sighted during night scouting.

PACIFIC MACKEREL: Pacific mackerel were very scarce. Only 3 catches of several fish each were made and no schools were observed during night scouting. Several small schools were observed on daytime anchorages at Blanca and Playa Maria Bays.

MISCELLANEOUS: Live anchovies taken at Cedros Island were delivered to the biological laboratory of the U. S. Bureau of Commercial Fisheries at La Jolla for racial studies. Bottom sediment cores were obtained in deep water for a study of the historical abundance of anchovies and sardines by Scripps Institution of Oceanography.

Sea surface temperatures were abnormally cool for the time of year. They ranged from 20.8° C. (69.4° F.) at Cedros Island to 15.5° C. (59.9° F.) at San Quentin Bay. Temperatures at the same time in 1963 averaged 4.1° C. (7.6° F.) warmer. Weather conditions were ideal only at Cedros Island and north of Punta Baja. Steady and moderate winds over the greater part of Sebastian Vizcaino Bay reduced blanket-net station effectiveness but did not seriously hamper trawl operations.

A rare ribbonfish (Desmodema polystichta) was caught in the midwater-trawl in the north end of Sebastian Vizcaino Bay.

M/V "Alaska" Cruise 64-A-7-Pelagic Fish (September 25-October 13, 1964): The coastal waters of northern Baja California from Punta Baja to the United States-Mexican Border were surveyed during this cruise by the research vessel Alaska. Objectives were to: (1) survey the pelagic environment and meas-

ure the density, age, size composition, and recruitment of inshore populations of sardines, anchovies, Pacific mackerel, and jack mackerel; and (2) to collect live anchovies for blood-genetic racial studies by biological laboratory of the U. S. Bureau of Commercial Fisheries at La Jolla.

The midwater trawl and blanket net were used to sample the pelagic environment. Visual night scouting between stations was conducted to measure the density of fish schools in the immediate cruise area. A total of 32 trawl and 40 light stations were occupied, and 139 miles of ocean were scouted for fish schools. Light and trawl stations were made in the same general areas.

NORTHERN ANCHOVY (*Engraulis mordax*): As on previous cruises, the anchovy was the most abundant fish species taken. Anchovies were found throughout the cruise area and were caught in 29 of the 32 midwater trawl tows. Night-light stations were not as productive; anchovies were caught at only 3 of the 40 stations. A total of 19 anchovy schools was counted in the 139 miles of ocean scouted between stations. Scouting conditions were generally poor, both because of low bioluminescence in the water and because of dense fog which made scouting impossible on several nights.

There were no detectable size differences among fish caught within the survey area. The size range was 69 to 144 millimeters (2.7 to 5.7 inches), with most in the 90- to 130-millimeter (3.5- to 5.1-inch) range. The smallest fish were caught 1 mile from shore in Bahia Todos Santos, and the largest 10 miles off Punta Santo Tomas. Anchovies were caught throughout the 14°C. to 20°C. (57.2° to 68.0° F.) temperature range encountered on the cruise.

JACK MACKEREL (*Trachurus symmetricus*): Jack mackerel were the second most abundant fish caught during the survey. They were not taken at any light stations, but were caught in 16 of the 32 midwater trawl tows. Most catches were small with less than 15 fish per tow, although 2,400 were caught in one tow near Punta Descanso. Only 7 mackerel schools were seen during night scouting.

PACIFIC SARDINE AND PACIFIC MACKEREL (*Sardinops caeruleus* and *Scomber diego*): A total of 23 sardines were caught at 4 trawl stations between Ensenada and Punta Baja. The size ranged from 181 to 230 mil-

limeters (7.1 to 9.1 inches). No sardine schools were seen between stations. Pacific mackerel were caught at two stations, one trawl, and one light.

Photometer measurements of water clarity taken during the cruise varied between 40 and 100. There was no apparent correlation between catches and photometer readings on this cruise. All trawls were made at night, and presumably, water clarity did not have too great an influence on catch-per-tow.

Airplane Spotting Flight 64-15-Pelagic Fish (October 28-29, 1964): To determine the inshore distribution and abundance of pelagic fish schools, the inshore area from Point Piedras Blancas to the United States-Mexican Border was surveyed from the air by the California Department of Fish and Game Cessna "182" N9042T.

On October 28 the area from Los Angeles Harbor to Point Piedras Blancas was scouted but weather conditions were not the best for aerial scouting. Rain storms were encountered at Piedras Blancas and a high cloud cover over most of the survey area severely restricted water visibility.

A total of 9 northern anchovy (*Engraulis mordax*) schools were found in Avila harbor. California bonito (*Sarda chiliensis*) were sighted near Goleta and Point Vicente. Seals and birds were feeding on 7 unidentified fish schools off Pismo Beach.

Red tide was light in intensity near Santa Barbara but quite heavy in the Ventura area. A very heavy oil slick (from natural seepage) covered the waters surface at Coal oil Point. It was the largest and heaviest oil slick seen in that area in two years.

The area from Point Dume to the United States-Mexican Border was scouted on the second day. Weather conditions were fair in the morning and excellent in the afternoon. Small groups of anchovies were seen at Encinitas and Point Vicente. Red tide was heavy in the southern portion of Santa Monica Bay and moderate in a strip just offshore from Seal Beach to La Jolla.

Note: See Commercial Fisheries Review, December 1964 p. 28.

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SHRIMP RESOURCES IN
NORTHERN COASTAL WATERS SURVEYED:
M/V "N. B. Scofield" Cruise 64-S-5-Shrimp
(September 2-16, 1964): The objectives of
this cruise in the coastal waters from Zuma
Beach, Calif., to Cape Ferrello, Oreg., by the
research vessel N. B. Scofield of the Califor-
nia Department of Fish and Game were to:

1. Make underwater observations of the Gulf of Mexico shrimp trawl in operation and make needed adjustments in doors and net to insure maximum fishing efficiency.
2. Locate concentrations of pink shrimp (Pandalus jordani) for determining population estimates and natural mortality rates.
3. Determine size, sex, and weight of shrimp.
4. Save all cephalopods, rare fish, and invertebrates for the State Fisheries Laboratory, Terminal Island, Calif.
5. Identify and record incidentally-caught fish and invertebrates.
6. Collect stomachs from hake (Merluccius productus) and other species of incidentally-caught fish for juvenile shrimp abundance index study.

One day of the cruise was spent off Zuma Beach, where 2 tows were made in 8 fathoms. SCUBA divers of the California Department of Fish and Game made dives on both tows to observe the net in operation. The doors were functioning satisfactorily, but it was felt that the footrope was fishing too far from the bottom. Chain was added which brought it to within 4-6 inches of the bottom. The chain was later removed after talks with commercial fishermen who reported that they fish their nets about 12 inches off the bottom. At the time those chains were removed, a tickler chain was added to the gear to run about 5 feet in front of the center of the footrope. Moving pictures were taken of the net and the reactions of the fish to the net. The width of the net when fishing was estimated to be 25 feet and the height 6 feet.

A total of 56 tows was made in the combined survey areas as follows: Zuma Beach, 2 tows; Fort Bragg (B-1), 5 tows; Redding Rock-Klamath River, 42 tows; Oregon border, 7 tows. The gear used was a 41-foot head-rope Gulf otter trawl with $1\frac{1}{2}$ -inch stretched

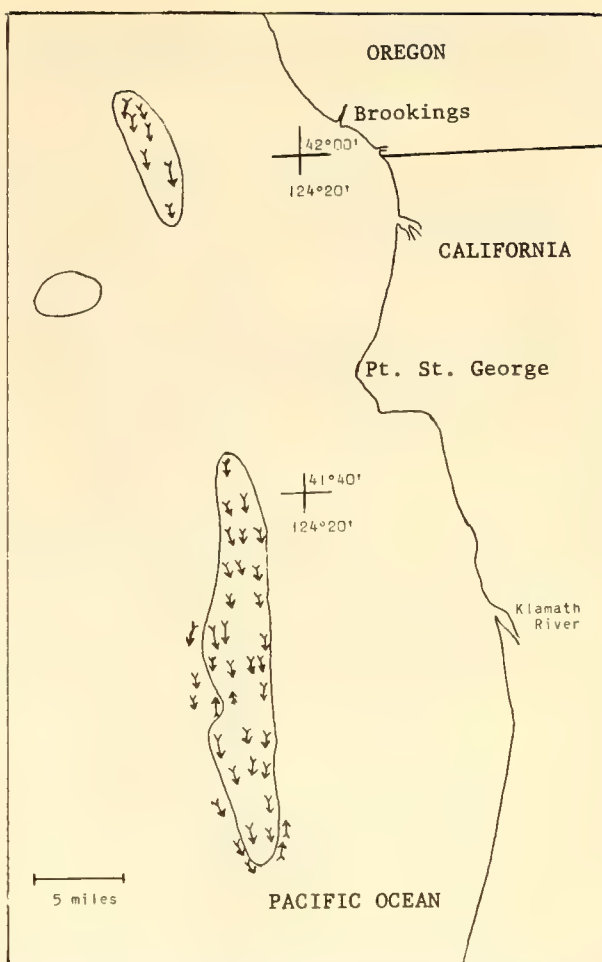


Fig. 1 - M/V N. B. Scofield Cruise 64-S-5-Shrimp (Area A).

mesh in the cod end. Of the tows made in the shrimp beds, 48 were of 20-minute duration and 6 lasted 30 minutes. On 15 of the tows, a $\frac{1}{2}$ -inch stretched mesh liner was used to catch juvenile shrimp and determine escapement of adult shrimp. The tows were made in depths ranging from 8 to 165 fathoms.

An average of 229 pounds of juvenile shrimp an hour was caught in the liner (average heads-on count of 734 to the pound). The average escapement of adults into the liner amounted to 10.8 percent and ranged from 1.0 percent to 44.4 percent. Adults in the liner averaged 110 per pound. About 70 percent of the adults in the liner were 1-year-olds; 29.2 percent were 2-year-olds; and 0.8 percent were 3-year-olds.

AREA A: The 7 tows made on the bed lying on the Oregon-California border yielded an

average shrimp catch per hour of 112 pounds. The total area was estimated to encompass 16 square miles and contain 159,393 pounds of shrimp.

The bed lying off Klamath River and Redding Rock was estimated to contain 1,671,856 pounds of shrimp in an area of 67 square miles. The average catch per hour was 267 pounds (ranging from 50 to 855 pounds).

The average count per pound for both beds was 84 and ranged from 64 to 111. One-year-olds formed 52.6 percent by number of the population of both beds; 2-year-olds 42.5 percent; and 4.9 percent were 3-years old.

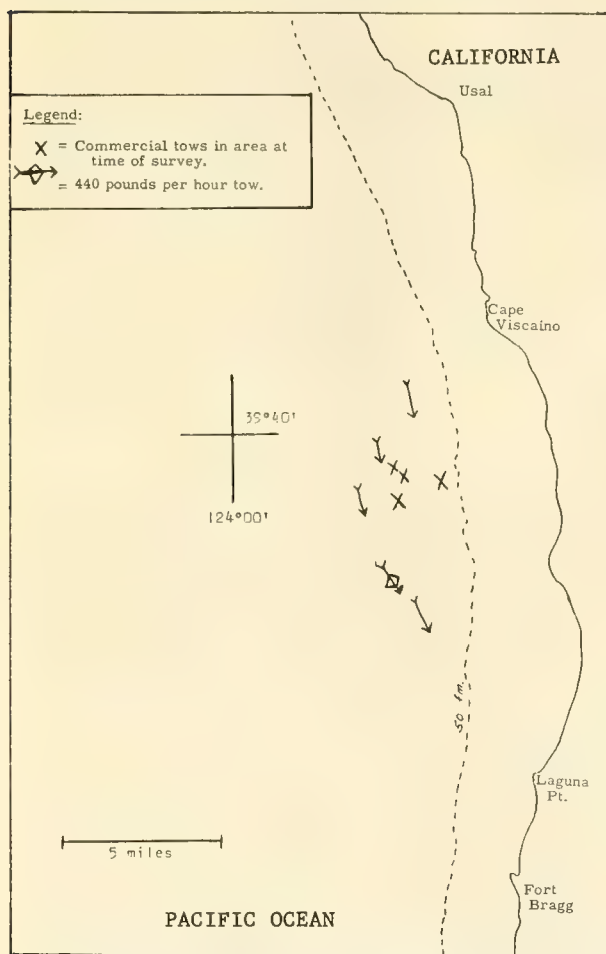


Fig. 2 - M/V N. B. Scofield Cruise 64-S-5-Shrimp (Area B-1).

Head roe was observed in 90.7 percent of the females and 40.3 percent of the transitionals. Incidental fish catches at times were quite heavy. Slender sole (*Lyopsetta exilis*) appeared in all of the tows. Dover sole (*Micro-*

stomus pacificus) were in 90 percent of the tows, and greenstripe rockfish (*Sebastes elongatus*), longnose skate (*Raja rhina*), eel pout (*Aprodon corteziannua* and *Lycodopsis pacifica*), slim sculpin (*Radulinus asprellus*), and hake appeared in over 60 percent of the tows. In all, 46 species of fish were identified in the tows.

A total of 28 dogfish (*Squalus acanthias*) were tagged in cooperation with the American Institute of Biological Sciences shark tagging program.

AREA B-1: Five tows were made on the area B-1 bed. The average catch per hour was 139 pounds with the best tow of 428 pounds an hour located 8.5 miles SSW. of Cape Vizcaino. The count per pound ranged between 77 and 87 with an average of 80.4. One-year-olds formed 44.8 percent by number of the samples taken, 2-year-olds 52.0 percent, and 3.2 percent were 3-year-olds.

Several rare and unusual fish species were saved for special study. A collection was also made of representative invertebrates found in association with shrimp.

Note: See *Commercial Fisheries Review*, October 1964 p. 18.

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ABUNDANCE AND CONDITION OF DUNGENESS CRAB SURVEYED PRIOR TO OPEN SEASON:

M/V "N. B. Scofield" Cruise 64-S-6 (September 29-October 25, 1964): To determine pre-season abundance and condition of legal and sublegal Dungeness crab (*Cancer magister*) in the San Francisco area for prediction of the 1964/65 season, the coastal waters off San Francisco from the Russian River to Point Montara were surveyed by the California Department of Fish and Game research vessel N. B. Scofield.

Sampling stations during this cruise were selected randomly from the crab areas between Point Montara and the Russian River. Commercial crab traps were baited with squid and rockfish and allowed to fish overnight at each of the 70 stations visited.

A total of 3,593 crab was taken at 70 stations in 694 traps. The catch consisted of 1,929 legal males, 1,422 sublegal males, and 242 females. The average legal catch per trap of 2.78 crabs is the lowest of any pre-season cruise. In 1963, 4.3 legal size per

trap were taken and 4.1 in 1962. The sublegal catch of 2.05 was also below the previous year's figure.

The best crab catch was in outer Bodega Bay in 10 fathoms of water. Fair catches were also made in Drakes Bay and off Double Point in 10 and 20 fathoms, respectively. According to the survey, it is believed the crab catch for the 1964/65 season will be 750,000 pounds, with estimates ranging from 600,000 to 900,000 pounds.

About 36 percent of the legal crab taken were soft--much higher than in the past 3 years when around 5 percent were soft.

Note: See Commercial Fisheries Review, January 1964 p. 8.

ABALONE OBSERVATIONS AND GROWTH STUDIES:

M/V "Mollusk" Cruise 64-M-2-Abalone (September 3-17, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel Mollusk in the coastal area from Pt. Estero to Cambria were to: (1) sample abalone in depths and areas selected at random for: numbers, sizes, gonad development, and sex ratios, and (2) observe relative abundance of invertebrates, vertebrates, and algae found in association with abalone.

During the cruise, 40 diving stations were occupied from Pt. Estero to Cambria, in an area about 7 miles long by $\frac{1}{2}$ to $\frac{3}{4}$ miles wide. An average dive lasted 30 minutes in water from 10 to over 75 feet deep. The area covered on each dive ranged from 100 to 1,210 square yards.

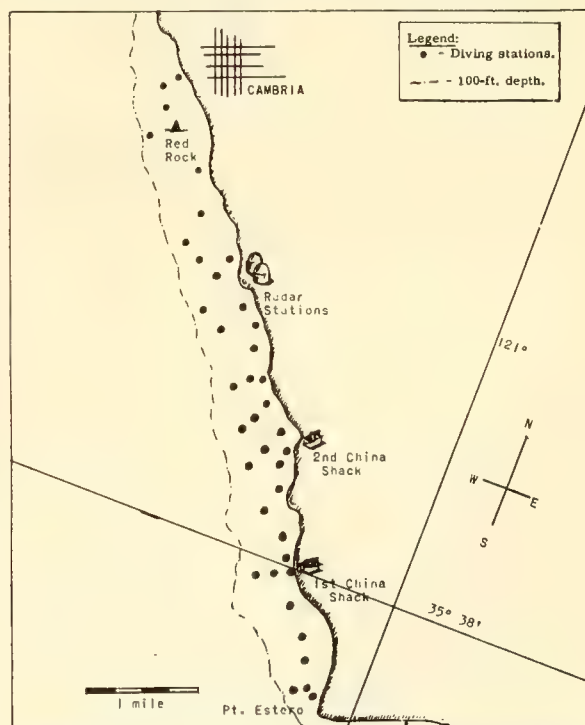
The survey showed there are large numbers of abalone within the area in varying concentration. Abalone density depends more upon ecological characteristics within an area than upon depth. At some stations numerous abalone of all sizes were found at 26-30 feet. At other stations of the same depth, few abalone of any size were observed.

Generally, "legal size" abalone ($7\frac{3}{4}$ inches and larger) were scarce in shallow (0-25 feet deep) waters. The 20- to 25-foot depth has been worked extensively by the commercial divers who, for the most part, have been unable to dive in deeper waters due to the practically impenetrable massive stands of bull kelp (Nereocystis) over most of the area.

The greatest numbers of abalone of all sizes were found at depths of 26 to 60 feet. Most of the sublegal size abalone (6 to $7\frac{3}{4}$ inches) appeared to be growing rapidly.

Many small abalone and several over 6 inches in length were recovered from the undersides of partially buried rocks; a number of small ones (1 inch) were recovered from beneath sea urchins. At depths greater than 70 feet no red abalone were found. Abalone sampled during the survey showed evidence of recent shell growth (some as much as an inch) and gonad development. Tests indicated that sperm and ova were active, but it was not possible to estimate when natural spawning would occur.

The area surveyed on this cruise is extremely rich in plant and animal life, both in



Shows diving stations occupied during M/V Mollusk Cruise 64-M-2-Abalone.

vairity and numbers. A number of different species or sponges, tunicates, and coral were observed as well as large numbers of chitons, sea urchin, and starfish. Numerous fish were present throughout the area. Schools of blue rockfish (Sebastes mystinus) in two predominant size ranges were noted on almost every dive. The smaller sizes (1 to 3

inches long) inhabited the surface waters while those 6 to 12 inches long were in deeper waters. Lingcod, cabezon, sea trout, and china and vermillion rockfish were also present.

Note: See Commercial Fisheries Review, November 1964 p. 23.

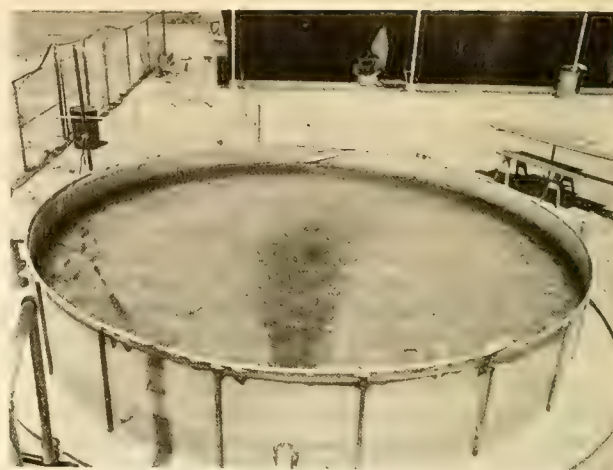
Cans--Shipments for Fishery

Products January-November 1964

A total of 2,592,305 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-November 1964, a decrease of 4.6 percent from the 2,719,239

base boxes used during the same period in 1963. The decline was due partially to a drop in the canning of jack mackerel, Main sardines, and shrimp.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.



Plastic pool in which skipjack tuna are held for study at the U.S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. Tank is 23 feet in diameter and has a water depth of 3 feet.

ly 30 years, but a skipjack fishery has recently been reestablished there.

Despite the importance of the skipjack tuna, very little is understood about its biology and population dynamics. In order to learn more concerning skipjack tuna, scientists at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, have been studying the origin and movements of the harvested groups of skipjack in the Pacific Ocean. A wide variety of data collected both at the Bureau's Honolulu Laboratory and at other research facilities has been examined. Some of these data involve larval distributions, subpopulation studies, gonad indexes, size distributions, tag recoveries and catch predictions. All of these data have been put together to formulate a model or set of hypotheses which could account for the origin and movement of the harvested skipjack in the Pacific Ocean.

The primary consideration of this model are the skipjack harvested in the eastern Pacific and Hawaiian fisheries. The fish harvested off the coast of Japan are not considered in the model, but they appear to originate from spawnings in the Ryukyu-Izu-Bonin Island chains, or perhaps from spawnings in the islands to the south of those chains.

In the eastern Pacific, it appears that skipjack spawning is negligible, so that skipjack harvested in that part of the ocean must come from somewhere else; the model postulates that those fish come from the central equa-

Central Pacific Fisheries Investigations

ORIGIN AND MOVEMENTS OF SKIPJACK TUNA IN PACIFIC OCEAN STUDIED:

The skipjack tuna is presently an important fishery resource in the Pacific Ocean and is potentially even more important for the future. In recent years, yields of that valuable fish have been about 250,000 metric tons a year. Large fisheries exist off the west coasts of North and South America and near the Japanese archipelago. A small but active skipjack fishery is also conducted in the Hawaiian Islands. The unexploited potential of the skipjack as a resource is demonstrated by the vast unfished areas of the Pacific Ocean where skipjack tuna occur. Large amounts of skipjack exist in those areas. For example, 35,000 metric tons of skipjack were taken in 1937 in the U. S. Trust Territories of the western Pacific Ocean. That area has been virtually unfished for skipjack for near-

torial Pacific. Studies of skipjack biology (primarily larval distributions and subpopulations) in the central Pacific have shown it is unlikely that skipjack in the central Pacific comprise a single homogeneous population unit.

The model suggests that of the various population units or subpopulations of the central Pacific, skipjack from spawnings in the central equatorial Pacific contribute the majority of fish harvested in both the eastern Pacific and Hawaiian fishery. Another interesting feature brought out by the study was a possible measure of skipjack year-class strength for the Hawaiian fishery.

The next step in determining the origin and movements of skipjack tuna in the central and eastern Pacific is to test features of this model. Some of those tests are under way.

* * * * *

TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

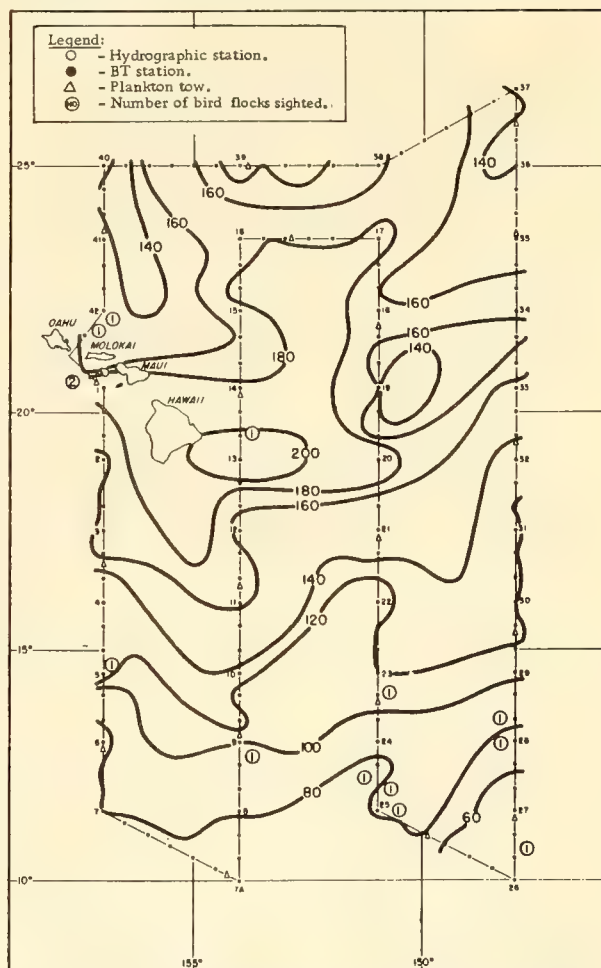
M/V "Townsend Cromwell" Cruise 11 (December 1-20, 1964): This was the tenth in a series of oceanographic cruises by the research vessel Townsend Cromwell to collect data on rates of change in the distribution of properties in the trade wind zone of the central North Pacific Ocean. The research vessel is operated by the Biological Laboratory of the U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii, which on this cruise collected data in an area of the central North Pacific bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W.

A total of 43 oceanographic stations was occupied on this cruise. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). Deep casts to 4,000 meters (13,123 feet) were taken at stations 21, 25, and 38.

The surface circulation and temperature distribution in the cruise area during December 1964 showed significant changes from the previous months. The westward flow of water south of 20° N. had broadened and was less intense. Over the entire cruise area the flow appeared to be more random than before. To the north of 20° N. a new set of eddies replaced the previous system in what appeared to have been an eastward shift of the pattern of the 20° C. isotherm depth. The thermocline in the south was less sharp than it appeared

in October while the mixed layer for the entire region was somewhat deeper than before. After the sharp drop in surface temperature noted in November, the cooling seemed nearly to have ceased, with the surface temperatures for December almost the same as for the previous month. The temperature pattern was similar to that for November with a very slight temperature drop in the south.

A total of 14 feeding bird flocks were sighted during the cruise as compared to the 23 sighted during the November cruise.



Cruise track chart of Townsend Cromwell, Cruise 11, (December 1-20, 1964), showing depth contours of the 20° C. isotherm in meters.

Bathythermograms (BT) were obtained at 30-mile intervals along the cruise track.

Other operations during the cruise included: (1) obtaining surface bucket temper-

atures and water samples for salinity analysis at each (BT) observation; (2) making dissolved oxygen determinations for each water sample at stations 7A to 16, 26 to 37, and at station 39; (3) releasing 20 plastic-enclosed drift cards at 30-mile intervals along the entire cruise track up to station 38; (4) taking a 30-minute surface plankton tow daily using a 1-meter net; and other observations.

Note: See Commercial Fisheries Review, February 1965 p. 17.



Columbia River

FLOODS IN DECEMBER 1964 CAUSE HEAVY DAMAGE:

Columbia River flood damage in late 1964 to Federally-financed fish hatcheries, ladders, and screens was estimated at about \$700,000. The losses occurred in Oregon, Washington, and Idaho to installations operated by the three States but financed by Federal funds under the Columbia River Fishery Development Program.

There was also heavy damage to fishery facilities financed and operated by the States themselves.

Among the Federally-financed operations damaged or destroyed were many fish screens in Oregon and Washington valued at \$390,000. The screens were placed at the entrances to irrigation ditches to prevent fish from entering.

A total of \$103,000 damage was reported to fish ladders in all three States, and \$201,500 damage was estimated at fish hatcheries in Washington and Oregon.

In addition to the physical damage, at least 10 million young fish in various hatcheries were lost. The lost fish included chinook and silver salmon and steelhead.

Damage to a recently-built fish flume on Eagle Creek near Estacada, Oreg., was estimated at \$20,000. The flume is a concrete and steel structure which the U. S. Bureau of Commercial Fisheries installed in order to test various kinds of fish guiding and collecting devices. Another flume on Grand Ronde River was damaged to the extent of \$5,000.



Federal Aid for Sport Fish and Wildlife Restoration

FUNDS APPORTIONED TO STATES, FISCAL YEAR 1965:

A final distribution of \$9,560,000 in Federal Aid funds for fish and wildlife restoration during fiscal year 1965 has been made to the 50 States, Guam, the Virgin Islands, and Puerto Rico, the U. S. Department of the Interior announced on January 19, 1965. Those funds come from excise taxes collected on fishing and hunting equipment. They are in addition to the preliminary apportionment of \$14,200,000 made earlier and bring to \$23,760,000 the total for fiscal year 1965.

Apportionment for Federal Aid in Fish and Wildlife Restoration, Fiscal Year 1965		
State	Fish Projects \$	Wildlife Restoration \$
Alabama	118,049.94	314,665.08
Alaska	349,750.00	835,250.00
Arizona	136,519.49	375,741.55
Arkansas	126,889.01	285,181.51
California	349,750.00	779,786.10
Colorado	169,568.74	428,469.57
Connecticut	69,950.00	83,525.00
Delaware	69,950.00	83,525.00
Florida	148,603.71	257,424.97
Georgia	151,236.83	299,065.99
Hawaii	69,950.00	83,525.00
Idaho	121,711.90	330,815.01
Illinois	181,517.11	415,203.17
Indiana	168,991.16	423,876.95
Iowa	120,940.95	312,599.59
Kansas	119,532.44	335,286.88
Kentucky	94,486.92	236,117.63
Louisiana	83,912.77	274,597.59
Maine	71,096.31	186,486.31
Maryland	69,950.00	114,497.45
Massachusetts	69,950.00	86,310.98
Michigan	252,080.92	629,956.12
Minnesota	328,064.67	460,422.94
Mississippi	103,850.30	265,344.57
Missouri	182,222.19	372,926.60
Montana	167,892.71	508,494.67
Nebraska	105,004.13	314,347.75
Nevada	104,487.95	321,508.53
New Hampshire	69,950.00	83,525.00
New Jersey	69,950.00	98,793.82
New Mexico	127,605.43	382,454.85
New York	184,034.14	529,973.09
North Carolina	104,860.06	353,591.34
North Dakota	69,950.00	231,015.31
Ohio	193,689.61	463,389.86
Oklahoma	150,030.91	303,191.17
Oregon	172,376.46	429,669.30
Pennsylvania	149,724.80	659,727.18
Rhode Island	69,950.00	83,525.00
South Carolina	83,301.00	186,078.01
South Dakota	92,671.00	320,538.80
Tennessee	159,073.69	348,504.30
Texas	349,750.00	835,250.00
Utah	109,496.77	335,980.27
Vermont	69,950.00	90,532.75
Virginia	96,392.21	301,110.70
Washington	134,298.55	347,809.57
West Virginia	69,950.00	177,383.25
Wisconsin	255,123.88	401,162.35
Wyoming	106,961.34	326,841.57
Guam	10,000.00	10,000.00
Puerto Rico	10,000.00	10,000.00
Virgin Islands	10,000.00	10,000.00
Totals	7,025,000.00	16,735,000.00

Of the total amount, \$16,735,000 is for wildlife restoration and \$7,025,000, which is a record high, is for fish projects.

The Interior Secretary said money apportioned to the States will be used for fish and

wildlife restoration projects involving the purchase of land, improvement or areas of land or water for fish and wildlife, and to conduct research for restoring and perpetuating those resources.

Under the Federal Aid program, the States initiate the projects and, if they meet the requirements established by the Department of the Interior, the funds allocated are used to reimburse the States up to 75 percent of the cost of completed projects.

The amount allocated for fiscal year 1965 under the Federal Aid in fish and wildlife restoration programs is nearly \$1 million more than the \$22,828,175.62 apportioned in fiscal year 1964.

Note: See Commercial Fisheries Review, August 1964 p. 20; April 1964 p. 14.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-DECEMBER 1964:

December 1964: FRESH AND FROZEN:
Purchases of fresh and frozen fishery prod-

Compared with the same month in the previous year, purchases in December 1964 were up 22 percent in quantity and 49 percent in value. Average prices were much higher for shrimp and scallops in December 1964. Prices were also up for halibut steaks, salmon steaks, and swordfish steaks.

FREEZE-DRIED: Purchases for the Armed Forces in December 1964 included 4,022 pounds of freeze-dried groundfish (cod or haddock) valued at \$4.99 a pound.

January-December 1964 Summary: FRESH AND FROZEN: Total purchases of fresh and frozen fishery products for the use of the Armed Forces in 1964 were up 13 percent in quantity and 16 percent in value from those in the previous year. Larger purchases of shrimp were one of the main reasons for the

Table 2 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, December 1964 with Comparisons

QUANTITY				VALUE			
Dec.		Jan.-Dec.		Dec.		Jan.-Dec.	
1964	1963	1964	1963	1964	1963	1964	1963
.....(1,000 Lbs.)..... (\$1,000).....							
2,041	1,678	26,341	23,400	1,328	894	15,040	13,017

Table 1 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, December 1964 with Comparisons

Product	December				Jan.-Dec.	
	1964		1963		1964	1963
	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Avg. Cost Cents/Pound	Quantity Pounds	Quantity Pounds
Shrimp:						
raw headless	33,650	98	1/	1/	1,234,200	1/
peeled and deveined	104,980	134	1/	1/	1,664,304	1/
breaded	385,000	87	1/	1/	4,245,770	1/
molded and breaded	49,000	64	1/	1/	496,620	1/
Total shrimp	572,630	94	518,997	74	7,640,894	7,095,062
Scallops	189,936	77	227,775	57	2,777,486	2,611,957
Oysters:						
Eastern	72,926	108	1/	1/	843,807	1/
Pacific	22,836	77	1/	1/	341,914	1/
Total oysters	95,762	101	83,520	99	1,185,721	1,217,450
Clams	44,200	29	18,786	43	280,183	273,528
Filletts:						
Cod	20,300	32	71,638	30	496,916	683,794
Flounder	204,000	31	206,244	29	3,062,452	2,957,221
Ocean perch	203,000	30	246,622	31	3,522,970	3,786,973
Haddock	131,752	37	73,610	40	1,898,066	2,086,546
Haddock portions	202,750	46	2/	2/	774,072	2/
Steaks:						
Halibut	71,867	49	75,680	38	1,278,144	1,408,900
Salmon	11,270	68	67,226	64	260,825	244,302
Swordfish	2,090	70	3,050	56	17,261	34,258

1/Breakdown not available

2/Not available.

ucts in December 1964 for the use of the Armed Forces were up 4 percent in quantity but down 6 percent in value from the previous month. The decline in value was due mainly to lower purchases of peeled and deveined shrimp.

increase in 1964. Shrimp purchases remained at a high level throughout 1964 in spite of a sharp price increase in late 1964. By the end of 1964, shrimp prices were considerably above those in late 1963.

Scallop purchases in 1964 were maintained at a level slightly above the previous year even though scallop prices throughout 1964 were higher than in 1963.

Oyster purchases in 1964 were down slightly from the previous year, although prices for eastern oysters during most of 1964 were below those in the previous year.

Average prices for finfish purchases in 1964 generally showed less fluctuation than those for shellfish. However, the average price for halibut steaks and salmon steaks in late 1964 was up considerably from the same period in 1963.

The average price per pound for the fresh and frozen purchases in 1964 was 57.1 cents compared with 55.6 cents in 1963 and 61.6 cents in 1962.

CANNED: Total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) in 1964 were up 24 percent in

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, December 1964 with Comparisons								
Product	QUANTITY				VALUE			
	Dec.	Jan.	Dec.	Dec.	Dec.	Jan.	Dec.	Dec.
	1964	1963	1964	1963	1964	1963	1964	1963
Tuna	645	364	5,714	4,367	269	154	2,513	1,990
Salmon	1	1	2,751	2,211	1	1	1,632	1,329
Sardine	11	31	312	489	7	13	181	193

quantity and 23 percent in value from those in 1963 due mainly to larger purchases of canned tuna. Purchases of canned salmon were also up, but purchases of canned sardines were down.

Prices for canned tuna were steady throughout 1964. Prices for canned pink salmon declined in the last quarter of 1964 following an exceptionally heavy pack of that species. On the other hand, prices for canned sardines moved higher in late 1964 after a rather disappointing canning season in Maine.

FREEZE-DRIED: Purchases of fishery products for the Armed Forces in 1964 included small lots of freeze-dried shrimp (priced at about \$10 a pound) and freeze-dried cod and haddock (priced at about \$5 a pound).

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, Feb. 1965 p. 21.

* * * * *

NEW PURCHASING CONTRACT PROVISIONS ANNOUNCED BY DEFENSE DEPARTMENT

Revised contract provisions covering bids, offers, and quotations on purchases by the U. S. Defense Department have been announced by Headquarters, Defense Subsistence Supply Center, 226 West Jackson Boulevard, Chicago, Illinois 60606. The revised provisions apply to pertinent solicitations issued on and after January 4, 1965. Copies of the revised contract provisions may be obtained from Regional Offices of the Defense Subsistence Supply Center.

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FEDERAL SPECIFICATION PROPOSED FOR FRESH AND FROZEN SHUCKED RAW CLAMS:

A "Proposed Federal Specification for Clams, Raw, Shucked: Fresh (Chilled) and Frozen," has been drafted by the U. S. Bureau of Commercial Fisheries. The specification was developed by the Bureau's Technological Laboratory, Gloucester, Mass., and was based on currently available technical information. The proposed specification has not yet been approved for promulgation and is subject to modification.

Copies of the draft of a "Proposed Federal Specification for Clams, Raw, Shucked: Fresh (Chilled) and Frozen" were distributed to the United States clam industry with the request that comments be submitted by February 1, 1965, to the Technological Laboratory, U. S. Bureau of Commercial Fisheries, Emerson Ave., Gloucester, Mass. Comments received after that date would be considered for inclusion in the next revision or amendment of the specification.

The Bureau was particularly interested in industry comments on the sizes as given in the specification for Class 1 Hard and Class 2 Soft Clams. Since the Military is the largest Government buyer of the items listed, the new specification will include their needs.

Federal specifications are designed to meet the requirements of Federal agencies for purchases of food products. By definition, a specification is an accurate description of the technical requirements for a material, product, or service including the procedure by which it will be determined that the requirements have been met.



Fish Preservation

RESEARCH GRANT TO UNIVERSITY OF WASHINGTON:

The National Science Foundation will contribute \$37,050 in matching funds to help the University of Washington expand fish preservation research facilities, Senator Warren G. Magnuson reported November 25, 1964.

The money will be used to remodel the food science area of the Fisheries Center at the University. Fish preservation research at the University involves irradiation and freeze-drying. (*Seattle Post Intelligencer*, November 26, 1964.)



Florida

FISHERIES, 1963:

Summary: Commercial landings of fish and shellfish at Florida ports during 1963 amounted to 186.2 million pounds valued at \$27.7 million ex-vessel as compared with 1962 landings of 186.9 million pounds valued at \$30.9 million. In 1963, about 61.5 million pounds were landed on Florida's east coast and 124.7 million pounds were landed on the west coast. From a volume standpoint, the leading species landed in Florida during 1963 were shrimp 39.4 million pounds (heads-on), black mullet (lisa) 35.9 million pounds, menhaden 25.7 million pounds, and blue crab 21.7 million pounds. Sixty-six percent of Florida's total catch in 1963 consisted of those 4 species. During 1963, a total of 14 species of finfish and 4 of shellfish were landed in Florida in quantities greater than 1 million pounds.

Shrimp: In Florida, shrimp continued to be the most valuable fisheries item. Florida

Area	1963	1962
	(Million Pounds)	
East Coast	4.5	5.2
Tortugas	16.7	14.0
Campeche	12.6	14.9
Upper West Coast . . .	4.1	3.0
Other Areas	1.5	0.2
Total	39.4	37.3

shrimp landings in 1963 had an ex-vessel value of \$14.0 million compared with \$17.1 million in the previous year. The total value of the Florida shrimp catch declined in 1963 even though shrimp landings were greater.

Florida shrimp landings (heads-on) in 1963 consisted of 32.9 million pounds pink shrimp, 4.7 million pounds white shrimp, 1.8 million pounds brown shrimp, and a small quantity of sea bob. The major shrimp-producing areas for the Florida shrimp fleet continued to be the Tortugas grounds off the southwest coast of Florida and the offshore Campeche grounds off the Mexican Gulf Coast.

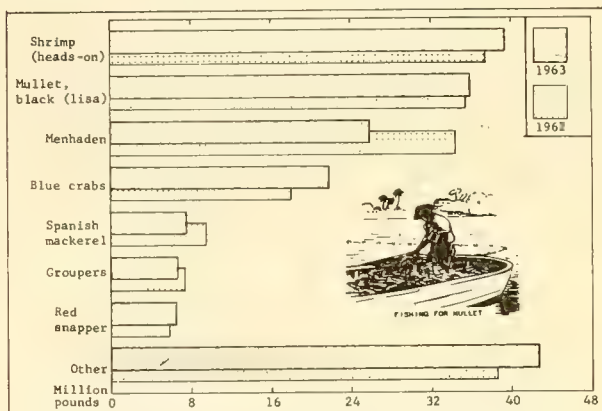


Fig. 1 - Florida landings of fish and shellfish, 1963 and 1962.

Oysters: Florida produced 4.4 million pounds of oyster meats in 1963--a decrease of 13 percent from the previous year's record catch. During the spring months of 1963 landings from public oyster reefs were on a comparable basis with the previous year. However, during the fall season there was a scarcity of marketable oysters.

Blue Crab: The Florida blue crab catch in 1963 totaled 21.7 million pounds with an ex-vessel value of \$1.1 million, a gain of 19 percent in quantity and 23 percent in value over the previous year. In 1963, cooked crab-meat production in Florida amounted to 3.4 million pounds with a wholesale value of almost \$4 million. Demand for Florida crab meat was good most of the year. Florida crab-meat producers in some instances received crab from other States during the low winter production period.

Spiny Lobster: The Florida catch of spiny lobsters in 1963 was 3.6 million pounds valued at \$1.4 million ex-vessel, an increase of 15 percent in quantity and 18 percent in value from the previous year. Demand remained strong all year despite heavy imports of spiny lobsters at Florida ports.

Spanish Mackerel: Florida landings of Spanish mackerel in 1963 amounted to 7.5

million pounds compared with 9.4 million pounds in the previous year. The catch in 1963 was valued at about \$700,000 to fishermen. It was not until December 1963 that Spanish mackerel schooled up on the Florida Bay side of the Keys and became available in quantity. During the previous year, most of the catch was made in the Hawks Channel area south of the Keys.

Mullet: Florida landings of almost 36 million pounds of mullet in 1963 valued at \$1.9 million ex-vessel were about the same as in the previous year. Market resistance during the heavy run in the fall of 1963 resulted in ex-vessel prices in some areas dropping to a reported low of 1 cent per pound. The average ex-vessel price per pound for mullet during 1963 was 5.2 cents.

Other Fisheries: The catch of other major species in Florida fluctuated somewhat during 1963. The 1963 landings of menhaden (25.7 million pounds) were 25 percent lower than in 1962. Red snapper landings in 1963 of 6.4 million pounds were up 6 percent while grouper landings of 6.8 million pounds in 1963 were down 6 percent. The 1963 catch of 2.3 million pounds of bluefish, 1.3 million pounds of king whiting, 800,000 pounds of pompano, and 3.4 million pounds of spotted sea trout was about equal to the landings of those species in 1962. King mackerel landings (5 million pounds) were up 22 percent. Landings of spot amounted to 1.5 million pounds, a gain of 48 percent over the previous year. Other species of fish and shellfish also showed some up-and-down fluctuations. There were substantial landings of fresh-water catfish, although exact data on that species were not available. Approximately 46 species of edible finfish and 13 species of edible shellfish were landed in significant quantities during 1963 by Florida's commercial fishermen.

Processed Fishery Products: The processed fishery products produced in Florida during 1963 had a wholesale value of \$43.8 million. The leading item was frozen packaged shrimp (headless, peeled and deveined, breaded, etc.). Fish fillets and steaks, frozen spiny lobsters, crab meat, and shucked oysters were also processed in substantial quantities.

Imports: During 1963, imports of fishery products through Florida ports became increasingly important. In the last 9 months of 1963, over 15 million pounds of fishery items entered through the Port of Miami. Shrimp in various forms amounted to almost 13 mil-



Fig. 2 - Fishing vessel unloading shrimp at a Florida fishing port.

lion pounds of that total. Points of origin were in countries in Europe, South America, and as far away as Japan. At least half of the Florida shrimp imports probably consisted of airborne imports. (C.F.S. No. 3602, Florida Landings, 1963, U. S. Bureau of Commercial Fisheries.)

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EXPLORATORY FISHING AND FISHERY INVESTIGATIONS BY RESEARCH VESSEL "HERNAN CORTEZ:"

A variety of fishery studies are being made off the Florida coast by the research vessel Hernan Cortez operated by the Salt Water Fisheries Division, Florida State Board of Conservation. Exploratory fishing is one of the major projects of the Hernan Cortez. Mid-water trawl tests are scheduled for early 1965. The vessel is seeking food fish stocks that can be caught cheaply, but in large quantities.

Other work of the Hernan Cortez includes: (1) making a study of the seaweed resource of Florida's broad Continental Shelf, (2) sampling water for phytoplankton and chemical studies related to "red tide," and (3) collecting zooplankton in connection with studies of the early stages of food fish and shellfish. (Florida State Board of Conservation, December 1964.)



Fluke

FERTILIZED EGGS INCUBATED AT SANDY HOOK MARINE LABORATORY:

Fertilized fluke eggs are being incubated at the Sandy Hook Marine Laboratory of the U. S. Bureau of Sport Fisheries and Wildlife as a result of a successful cruise by the Bureau's new research vessel Dolphin. In early November 1964, biologists from New York, New Jersey, and Virginia joined Bureau scientists aboard the Dolphin to sample offshore areas between Barnegat Bay and Delaware for fluke spawning areas. This is part of a cooperative program between the U. S. Fish and Wildlife Service and the Middle Atlantic States to delineate the offshore spawning areas and to determine oceanographic factors affecting the movement and survival of young fluke.

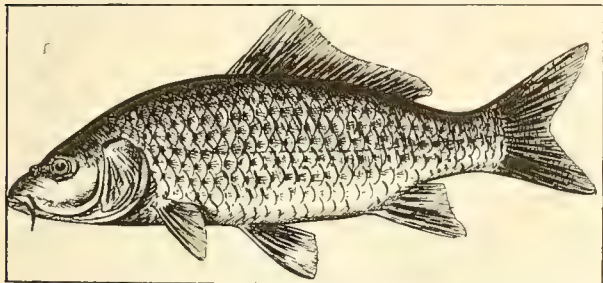


Great Lakes

COMMERCIAL FISHERY LANDINGS LOWER IN FIRST HALF OF 1964:

United States Great Lakes commercial fishery landings of 26.7 million pounds for four states (Michigan, Ohio, Pennsylvania, Wisconsin) in the first half of 1964 were down slightly as compared with 26.9 million pounds landed in the same period of 1963. Commercial fishery landings for those four states during all of 1963 were 52.9 million pounds, accounting for about 95 percent of the total United States Great Lakes commercial landings.

Landings for Michigan (9.3 million pounds) and Wisconsin (8.5 million pounds) during the



Carp range from 2 to 12 pounds and are sold as fresh whole fish; some as fillets, live, smoked; and also used in "gefilte" fish.

first six months of 1964 were up from the previous year because of marked increases in catches of alewife and yellow perch from Lake Michigan.

Landings of principal species for the period were: alewife 4.9 million pounds from Lake Michigan; sheepshead 3.7 million pounds from Lake Erie; herring 2.2 million pounds from Lake Superior; carp 0.6 million pounds from Lake Huron.

Canada's Great Lakes commercial fishery landings in the first half of 1964 amounted to 13.9 million pounds--down about one-third from the same period in 1963, according to preliminary data. The decline was primarily due to a 41-percent drop in Lake Erie landings (from 17.4 to 10.3 million pounds). Yellow perch landings in Lake Erie were down by nearly two-thirds, from 9.4 million pounds in 1963 to 3.2 million pounds during the first half of 1964.

* * * * *

LAKE TROUT PLANTING PROGRAM IN LAKE SUPERIOR, 1964:

A total of 2.6 million yearling lake trout were planted in Lake Superior in 1964 by participating United States and Canadian agencies. In 1963, plantings of young lake trout in Lake Superior were 2.3 million fish, of which some 2 million were yearling and the remainder fingerling lake trout.

Restoration efforts of lake trout in Lake Superior appeared to be showing good results based on studies made. The trend of improved survival among larger and older fish continued toward the end of 1964, and the incidence of lamprey-wounded lake trout remained at a very low level. As the year came to a close, there were encouraging signs that natural lake trout reproduction may be on the rebound. (Michigan Department of Conservation Bulletin, December 24, 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 17.

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RESTOCKING WORK WITH LAKE TROUT AND SALMON:

Lake Trout: Plans for building up lake trout stocks in the upper Great Lakes are gaining momentum. In the fall of 1964 more than 15 million trout eggs were collected from brood stock at hatcheries of the Michigan State Department of Conservation. Collections in other state, Federal, and Canadian hatcheries will supply another 3 million lake trout eggs. From that total of over 18 million eggs, an estimated $5\frac{1}{2}$ to 6 million yearling trout will survive hatching and rearing for release in Great Lakes waters in

1966, according to the Assistant Director of the Great Lakes Fishery Commission.

Plans call for most of the yearling trout bound for the Great Lakes in 1966 to go into Lake Superior where more than 10 million trout have been planted since 1958.

There is a strong possibility that some hatchery trout will be liberated in Lake Michigan, provided that sea lamprey populations are well enough under control to insure good trout survival.

Intensive efforts to restock Lake Huron are not expected to begin until 1967 at the earliest.

From Lake Superior, the first battlefront in the fight to bring back lake trout populations, studies continue to show signs of success, according to the Assistant Director of the Great Lakes Fishery Commission.

"Trends of improved survival among larger and older fish, which started in 1962, are still holding true," he said. "By the same token, the incidence of lamprey-wounded trout remains at a very low level, reflecting a wholesale reduction of the eel-like predators by chemical treatment in the Lake's tributaries."

In regard to small and medium trout, he said there were good indications that releases of hatchery-reared trout during the last few years had largely offset shortages caused by a lack of natural spawning since 1959.

With more mature fish showing up in sample catches and spawning fairly widespread in Lake Superior, natural reproduction may now be on the rebound. In the Apostles Island area of Wisconsin waters, the number of spawning lake trout in 1964 was 10 times greater than in 1963. (Michigan Department of Conservation, December 17, 1964.)

Salmon: Midwestern fishermen may soon be challenged by the fighting coho (silver) salmon from the Pacific. A bold plan is underway to bring this famous game fish from the Pacific fiords to the Great Lakes. The Oregon Fish Commission in January 1965 provided the State of Michigan with 500,000 fertilized coho salmon eggs. They were flown in from Oregon and will be reared at state-operated hatcheries in Oden and Harrietta as introductory planting stock in the upper Great

Lakes. Michigan may get another 500,000 fertilized coho eggs from other West Coast hatcheries. Fish from those eggs will be hatched and reared to the size of 6 inches before their release in the upper Great Lakes, which is scheduled for late fall or spring 1966.

The Michigan State Department of Conservation plans to release coho salmon in the Great Lakes for 3 years. The aim is to establish runs of adult fish in waters where they can be captured for spawn-taking purposes. Hopefully, too, some natural reproduction will occur.

As with any attempt to introduce a new species, success of the coho program is not a sure-fire thing, but fisheries men are optimistic about its chances. A Michigan fisheries official said, "From what we've learned about the coho, we think this program is going to click. At any rate, it's worth shooting for."

The coho plantings are tied in with the broad effort to rebuild sport fishery stocks of the Great Lakes to the level that existed before 1945. Boosting hopes for the sport fishery are the success of lamprey control and lake trout restoration work in Lake Superior, and the promising prospects for similar results in Lake Michigan and Lake Huron.

The timing of coho spawning runs should supplement migrations of trout to provide a longer fishing season.

The coho dies after spawning once, usually in its third year. In western streams, coho range from 6 to 12 pounds at maturity. In the fresh waters of the Great Lakes, the coho is expected to run smaller, probably ranging between 3 and 6 pounds.

The coho feeds on plankton at an early age and then shifts its diet to fish during its second or third year. It is expected to feed chiefly on smelt and alewife in the Great Lakes. Populations of alewife have exploded in the Great Lakes during recent years and offer an abundant food supply for coho salmon. (Michigan Department of Conservation, December 19, 1964.)



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-24 (December 8-19, 1964): The best catches of brown shrimp were made in area 20 during this cruise by the chartered research vessel Gus III. The cruise was another in a series of cruises of a continuing shrimp distribution study in the Gulf of Mexico conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

Although bad weather hampered trawling operations in the survey area, a total of 28 tows with a 45-foot Gulf of Mexico flat trawl was made. In addition, 63 plankton tows, 41 bathythermograph, and 167 water (Nansen bottle) samples were taken. Drift bottles cast at 27 stations during the cruise totaled 162.

All of the 8 statistical areas worked during this cruise yielded fair to moderate quantities of brown shrimp of various sizes. The largest catch from area 20 yielded 45 pounds of 31-40 count shrimp from the 10- to 20-fathom depth and 33 pounds of 15-20 count shrimp from over 20 fathoms. That area also yielded a few pounds of large white shrimp and a scattering of pink.

Area 19 yielded 33 pounds of 31-40 count brown shrimp from the 10-20 fathom depth. No shrimp were caught in the other two depth ranges of the area.

A fair quantity of 15-20 count white shrimp (27 pounds) was taken in the 10-20 fathom depth range of area 13. The up to 10-fathom depth yielded 17 pounds of smaller white shrimp, and 9 pounds of brown 26-30 count brown shrimp was caught in the over 20-fathom depth.

Area 17 yielded some 50 pounds of 26-30 count brown and white shrimp about equally divided from the up to 10- and over 20-fathom depths.

Brown shrimp catches predominated in area 18--a total of 33 pounds of 15-20 count and smaller from the 10-20 and over 20-fathom depths. A few pounds of pink also were taken from that area.

Note: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, February 1965 p. 25.

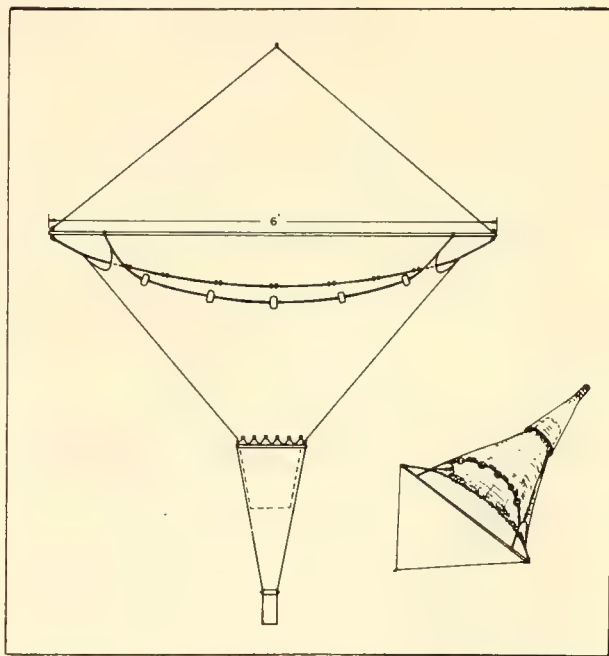
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Some of the highlights of studies conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., during October-December 1964:

SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies: Larvae of the pink shrimp, Penaeus duorarum, were reared to postlarvae and those of the rock shrimp, Sicyonia dorsalis, to first protozoaeae.

Work to ascertain the effects of various environmental conditions on larval development of the brown shrimp, P. aztecus, continued. In two experiments to determine the effects of salinity, the larvae did not live beyond the first protozoal stage. One temperature experiment was also completed. Larvae reared at 18° C. (64.4° F.) and 32° C. (89.6° F.) died at the molt to first protozoaeae. Development, however, was successfully completed at intermediate temperatures, the first postlarval stage being reached in 15 days at 24° C. (75.2° F.), in 12 days at 27° C. (80.6° F.), and in 11 days at 30° C. (86° F.).

Examination of 82 plankton samples collected in July and August 1963 revealed planktonic-stage penaeids to be considerably more numerous in the western (Galveston-Brownsville) than in the eastern portion (Galveston-Mississippi River) of the sampling area. Seasonal abundance, however, showed an overall increase in all areas.



A net designed to catch postlarvae shrimp in shallow areas along the shore. One man wading can easily handle the net.

Similarly, planktonic stages of Penaeus spp. were 6 to 7 times more abundant in the western sector than in the eastern, with a general increase in seasonal abundance in all areas. Although planktonic-stage Penaeus spp. occurred at all stations, greatest concentrations were found at those located inside 25 fathoms. Analy-

sis of monthly catches by planktonic stage revealed that advanced stages (Mysis and postlarval) predominated in the east, whereas earlier stages (naupliar and protozoal) prevailed in the west. This observation, in addition to the greater abundance noted in the west, indicates that spawning was considerably more intensive in Gulf waters west of Galveston.

In our continuing investigation of the possibility that postlarval *Penaeus* spp. concentrate on the bottom prior to their movement into nursery areas, a modified Clarke-Bumpus sampler was mounted on a sled so that its net fished approximately 5-6 inches above the bottom. The performance of this gear has been good and results obtained with it appear promising. In November 1964, its sampling efficiency was compared with that of the Gulf-V plankton net.

Although *Penaeus* spp. postlarvae were neither taken at upper levels of the water column with the Gulf-V sampler nor on the bottom with the Clarke-Bumpus net, large numbers of *Trachypeneus* spp. and *Sicyonia* spp. larvae, postlarvae, and juveniles were captured in both regions.

Young shrimp were caught in the water column with the Gulf-V net at only the 15- and 25-fathom stations, their relative abundance increasing with depth and temperature. These shrimp consisted entirely of protozoal- and mysis-stage larvae. In contrast, the numbers of shrimp taken just off the bottom with the Clarke-Bumpus net increased from the $4\frac{1}{2}$ -fathom station out to the 15-fathom station, with none being encountered at the 25-fathom station. At the $4\frac{1}{2}$ - and $7\frac{1}{2}$ -fathom stations, the catch consisted of postlarvae and juveniles, whereas at the 15-fathom station many advanced-stage mysids were taken.

Florida Bay Ecology Studies: During the quarter, work on the ecology of juvenile pink shrimp, *Penaeus duorarum*, was concerned primarily with developing sampling methods and selecting locations. Tests were conducted with the unit-area sampler on various substrate types in Biscayne Bay (Fla.) with encouraging results. At a shallow-water site, 40 pink shrimp ranging from 40 to 80 mm. (1.6-3.1 inches) total length were placed in two samplers. The chlorine repellent was effective in moving all the test animals from the main enclosure into the small trap at the end of each sampler within 15 minutes after its release.

In an attempt to determine the efficiency of the device in sampling a natural population of shrimp and associated animals, a sampler with a removable top was dropped in shallow water where shrimp were known to occur. Fifteen minutes after the chlorine repellent was released, the trap entrance was blocked, and the organisms remaining in the enclosure were removed with dip nets. Results indicated that this device is effective in drawing a quantitative sample from the natural population when fished on substrates where shrimp are not too deeply buried, or where very small shrimp do not occur. Additional experiments are being carried out in an attempt to broaden its usefulness.

If possible, indices of *Penaeus* postlarval abundance will be developed from material collected in the area now being surveyed. Postlarval penaeids, though not abundant there during the month of December, were occasionally taken with the small beam trawl whose bag was fitted with an extra-fine-mesh cover.

Abundance and Distribution of Larvae of Pink Shrimp:

A single cruise, representing the final stage of field work on this project, was undertaken during the quarter. Forty-two stations, distributed in a grid pattern over the Tortugas Shelf, Florida Bay, the Florida Straits, and Hawk Channel, were occupied. The object of the cruise was to obtain a semi-synoptic picture of larval distribution patterns over a wide area of the Tortugas Shelf. At the same time, 240 seabed drifters were released, but returns (only 7 to date) have been poor. Since the majority of release sites were situated to the northeast of the principal trawling grounds, the lack of returns may, however, have significance in indicating the direction in which water currents do not generally move. (Conducted by University of Miami under contract.)

Juvenile Phase of the Life History of the Pink Shrimp:

Samples of juvenile pink shrimp migrating out of White-water Bay via Buttonwood Canal, Flamingo, Fla. (Everglades National Park Nursery Grounds) have been collected monthly from January 1963 through December 1964. Although shrimp were taken in every month, their numbers varied greatly. In 1963, three peaks of abundance were observed, one each in January, April, and September. The latter two were the greatest and about equal in amplitude.

In 1964, however, only two peaks occurred, one in March and another in June, both of which were larger than those of 1963. The June peak was the largest and nearly three times greater than any of the peaks in 1963. It appears that peaks of juvenile abundance can occur in spring, summer, and early fall. The periods of lowest abundance occurred in late fall and winter, and in the spring. Shrimp associated with peaks in abundance were somewhat smaller than the overall average, which was about 14 mm. in terms of carapace length. In June 1964, when greatest numbers were recorded, the average carapace length was 10 mm. or 0.39 inch. (Conducted by University of Miami under contract.)

SHRIMP DYNAMICS PROGRAM: Surveys of Postlarval Abundance and Fisheries for Bait (Juvenile)

Shrimp: Sampling for postlarval shrimp continued during the quarter at four locations along the Texas coast. As is normally the case at that time of year, the number of postlarvae in sample catches dropped sharply at all locations. One unusually large catch for the season was made at Gilchrist (Tex.) on December 2, however, when 110 postlarval brown shrimp were collected.

In October-November 1964, commercial bait shrimp production in the Galveston Bay area dropped 24 percent from that recorded for the same period in 1963. During that period the harvest of bait-size brown shrimp decreased 75 percent. Juvenile pink shrimp were unusually abundant in Galveston Bay during 1964. Landings of that species for bait (mostly during mid-year) totaled 10,900 pounds, surpassing the combined catch of small pink shrimp over the previous 5 years. Due probably to uncommonly mild weather, bait shrimp (practically all white shrimp) remained plentiful well into December.

Commercial Catch Sampling: Catch-sampling activities in Texas and Louisiana declined during the quarter due to a seasonal decrease in shrimp abundance and consequent lull in fishing operations. Interview information indicated that heaviest concentrations of brown shrimp were present in 15 to 20 fathoms south of Freeport (Tex.), and of white shrimp in 2 to 5 fath-

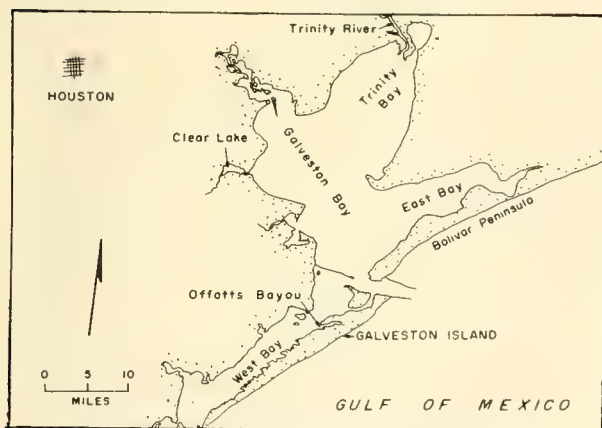
oms between Freeport and Morgan City (La.). Few small shrimp of either species were discarded at sea.

The shrimp fleet at Key West (Fla.) increased in size from 87 vessels in early October to over 200 by

Month	Year	Catch Lbs.	Catch/ Effort Lbs./Hr.	Distribution by Species Brown Pink White		
				... (Percentage) ...		
October	1964	101,200	31.7	7	0	93
	1963	178,900	42.5	20	0	80
November	1964	59,300	28.1	3	0	96
	1963	32,200	22.4	5	0	95
December	1964	... Data not yet processed ...				
	1963	3,600	13.3	0	0	100

the end of December. Although fishing operations were hampered by rough seas during the quarter, production exceeded that for the same portion of 1963. The installation of machine-grading devices by several shrimp processors in the Key West area is thought to have influenced the culling practices of Tortugas shrimp fishermen. Only half as many small shrimp were discarded at sea in the last quarter of 1964 as during the same period in 1963 (4.4 percent of the total weight caught in 1964 against 8.8 percent in 1963).

Migrations, Growth, and Mortality of Brown and White Shrimp: Returns from the brown shrimp mark-recapture experiment initiated in June off Freeport (Tex.) appear to be complete with 166 tagged individuals (8 percent of the number released) recovered. Ten of those shrimp had been at liberty more than 80 days and had traveled an average distance of less than 15 miles from their release sites, as compared to 13 miles for shrimp recovered within 80 days of release. During the season and in the area involved, it appears that adult brown shrimp do not move great distances.



In mid-August, 3,384 stained shrimp were released in 13 to 17 fathoms off Freeport. To date, 263 (8 percent) have been returned. The distribution of those recoveries indicates little offshore movement in August and September. Only 4 shrimp were recovered beyond 20 fathoms, although considerable fishing effort was expended at greater depths. Coastwise movement also was minimal and the majority of recaptured shrimp were taken within the release area. Mortality estimates for the marked population are being computed.

Population Studies: The influence of mesh size on the fishing characteristics of shrimp nets was investi-

gated by attaching echo-sounding transducers to the otter boards of the experimental trawls. Earlier measurements of change in the spread of the otter boards resulting from differences in net-mesh size were partially confirmed. The transducers are presently being modified to allow measurement over a range of vessel speeds. It is anticipated that future experiments will provide an explanation for the occurrence of more large shrimp in the catch of nets constructed with large meshes than in nets with small meshes.

Catch data from recent cruises permit general inferences to be drawn concerning the reliability of trawls as sampling gear for adult shrimp. On several occasions, three trawls of similar construction have been towed simultaneously by our research vessel. Differences in the number of shrimp caught by the three nets have been slight when fishing was done in offshore waters. The small variance associated with these catches is believed to indicate that each of the trawls caught a constant and representative portion of the population present. Similar trials conducted in shallow bay waters produced comparable results when shrimp population densities were relatively low. At high population densities, however, differences in the catch of the three nets were often as great as 50 percent, presumably as a result of the nonuniform distribution of shrimp on the fishing grounds.

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: The bay anchovy was the most numerous species taken in trawl biological samples during the quarter, followed in descending order of abundance by the white shrimp, Atlantic croaker, brown shrimp, sand sea trout, and spot. The relatively high temperatures experienced during December were apparently responsible for the exceptionally high catches made in the middle of that month. Sample catches of the above species were up 20 percent over those made in mid-December of 1963. The increase was due primarily to larger catches of Atlantic croaker and white shrimp which increased 170 and 48 percent, respectively.

Young-of-the-year Atlantic croaker entered the estuary in November and by December were present in large numbers throughout the area. The bay anchovy, on the other hand, was present in greatest numbers in October, with catches declining almost 80 percent by December. Heaviest concentrations of both croakers and anchovies were found in East and Trinity Bays. It is interesting to note that during that period in both 1963 and 1964 a marked decrease in anchovy numbers coincided closely with the buildup of the croaker population.

A study of the distribution of juvenile and subadult brown shrimp (sampled with a 10-foot shrimp trawl) is being conducted to supplement the study of postlarval and early juvenile distribution. Juvenile shrimp tend to concentrate in the shore-zone areas of East, Trinity, and Upper Galveston Bays. They were first observed in the lower bays during early April (postlarvae were first observed there in late March), but were not captured in the upper bays until 2 weeks later. This time lag corresponds closely with the time required for postlarvae to arrive in the upper bays after their appearance in the lower bays, and suggests that the postlarvae grow very little prior to their arrival in the peripheral nursery areas of the bays.

Interestingly enough, the subadults, when moving toward the Gulf, did not use the Houston Ship Channel as did the immigrating postlarvae, but instead moved along the shore and in the open waters. When they reached

the tidal pass, however, they entered the Channel and followed it in their return to the Gulf.

INDUSTRIAL BOTTOMFISH FISHERY PROGRAM:
Life Histories of Central Gulf Bottomfish: Growth measurements for Atlantic croaker representing the 1958-63 year-classes were derived from a fairly large volume of weight frequency data. The data indicate that growth is rapid during the first 3 years of life, the percentage increase in weight during the second year being more than twice the increase exhibited in the third.

Analysis of size-frequency data from commercially caught croaker revealed that individuals are first recruited to the fishable stock (in the Gulf near Mobile Bay) during June when approximately 9 months old and at an average size of 11 cm. (10 g.). By September, yearling fish about 12 months old and sexually immature average 13 cm. (20 g.). Collections by personnel of the Alabama Marine Resources Laboratory revealed that yearlings of comparable size (12 cm. and 15 g.) are present during October in Mobile Bay. They apparently remain in the bay throughout the winter and spring, being eventually recruited to the fishery the following summer. At this time they are about 21 months old and average 14 cm. in length (30 g. in weight). Yearling fish, recruited to the stock during the previous year and also contributing to the summer fishery are somewhat larger 15.5 cm. and 35 g.).

These observations indicate that part of a year-class may not contribute to the offshore fishery until almost a year after its members attain commercial size. Rapid growth during this interval in the estuary and nearby Gulf results in more than a threefold increase in the average weight per recruit to the fishery. In the remainder of the year-class, recruitment and exploitation are coincident and occur when the average fish is almost 2 years old.

Commercial Catch Sampling: A method to determine optimum bottomfish grounds in the north-central Gulf employs seasonal indices of mean annual bottomfish abundance (catch per hour) for the 5-year period 1959-63, and associated coefficients of variation. The area with the highest average abundance and the lowest coefficient of variation represents the ground where, over the years, average fishing success has consistently been greatest.

Area	Average Annual Abundance 1959-63	Coefficient of Variation
	Tons per Hour	Percentage
Nearshore (Apr.-Sept.):		
East of Delta	0.71	19
West of Delta	0.61	31
Offshore (Dec.-May):		
East of Delta	0.46	26
West of Delta	0.45	21

By this means of assessment, the nearshore area east of the Mississippi River Delta proved to be the most productive bottomfish ground. Although fish abundance on the nearshore ground west of the Delta was relatively high (0.61 ton per hour), its annual variation was the greatest of all four areas. The offshore grounds (Dec. to May) contained smaller concentrations of bottomfish than the nearshore grounds (Apr.-Sept.). Year-to-year variation in the magnitude of offshore stocks was intermediate between comparable measures for nearshore grounds east and west of the Delta.

Note: See Commercial Fisheries Review, November 1964 p. 43.

Industrial Fishery Products

LEVEL OF FISH MEAL UTILIZATION IN NEW ENGLAND POULTRY RATIIONS:

Mixed feed producers and experiment stations in a number of New England States (Maine, Massachusetts, and New Hampshire) as well as some fish reduction plants in Maine were visited in early December 1964 by a nutritionist of the U.S. Bureau of Commercial Fisheries Technical Advisory Unit, Boston, Mass.

Observations of the nutritionist during those visits and his conclusions follow:

With one notable exception, the levels of fish meal utilization in New England poultry rations are relatively high. The levels presently recommended by the New England College Conference Board¹ are 10, 5, 5, 5, and 3.75 percent, respectively, for turkey starter (first 9 weeks), broiler starter, broiler finisher, turkey breeder, and chicken breeder rations; these are the same as the 1963-1964 Board recommendations.

The recommended level of 3.75 percent fish meal in the chicken breeder rations is greater than the amount recommended by some other authorities. For example, Morrison² recommends that 2.5 percent fish meal be included in chicken breeder rations together with an equal amount of meat and bone scrap. Cornell University nutritionists³ recommend a minimal level of animal proteins (fish meal, fish solubles, meat scraps) of 0 to 5 percent in chicken breeder rations.

The fairly liberal New England fish meal allowance is based upon evidence that fish meal in hens' rations results in increased rate of growth of chicks. The fish-meal levels recommended by the New England College Conference Board, despite their liberality, are frequently exceeded by mixed feed producers in the region. For example, one large New England firm visited by the Bureau nutritionist incorporates fish meal in broiler starter rations at a level of 7 percent.

The State of Maine, ranking about eighth largest among the broiler-producing states, represents a fairly large market for fish meal. In addition, a considerable amount of fish meal is used by the New England pork production industry. Most of the hogs raised in New England are first fed mixed rations (that often contain fish meal) and later are fed garbage until they reach slaughter weight.

The exception to the usual New England practice of liberal fish meal use is that of some producers who recently have built small feed mills in New England. Those producers have deleted fish meal together with several other ingredients from poultry rations because of lack of storage space and the high cost of feed ingredients when purchased in the small lots in which they are compelled to order them compared with the cost of those items in carload lots. Although, according to University of Maine nutritionists, experiment station authorities earlier attempted to dissuade the newly organized mixed feed producers from dropping fish meal from their formulas, the feed producers felt that they were compelled to do so by their cramped quarters and prevailing fish meal prices.

Extension workers at the University of Maine are working on a program directed toward lowering feed costs and improving the competitive position of the Maine poultry industry. A professor at the University of Massachusetts, among a number of basic investigations, is carrying out studies of endocrine influences in production. At the University of Massachusetts another professor is conducting research that reasonably may be expected to lead to some increase in the use of fish meal in swine feeding. At the University of New Hampshire, a faculty member and his co-workers are determining the niacin (B-vitamin) requirements of the hen. The control ration used in the experiments contained approximately 24 milligrams of niacin per pound of feed. Part of this niacin was provided by the 3.75 percent fish meal of the ration. (Fish meal contains 17 to 42 milligrams of niacin per pound of meal.) Niacin deficiencies lead to reductions in feed consumption and egg production of hens and reduced hatchability of eggs. Also at the University of New Hampshire, workers have determined that a daylight period of 12 hours is suffi-

cient for maximum broiler growth, a finding that may be expected to contribute to greater economy in production and, eventually, to a greater broiler industry in New England and hence to increased fish meal utilization in the region.

At all of the experiment stations visited by the nutritionist, the possibilities for productive research offered by condensed fish solubles and other industrial fish products were discussed. Because very little research has been done on fish solubles, with the exception of determinations of its unidentified growth factor (UGF) value, that product offers many research possibilities.

1/1965 Chicken and Turkey Rations. Cooperative Extension Service University of Maine (at Orono) and the U.S. Department of Agriculture cooperating.
2/Morrison, Frank B. Feeds and Feeding, 1959. The Morrison Publ. Co., Clinton, Iowa.
3/New York State College of Agriculture Extension Stencil #205 Revised Oct. 1, 1960. Ithaca, N.Y.

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U. S. FISH MEAL, OIL, AND SOLUBLES:

November 1964: United States production of fish meal in November 1964 was lower by 33.0 percent as compared with November 1963. Production of fish oil was down by 32.8 percent and production of fish solubles decreased 41.6 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, November 1964					
Item and Period	1/1964	1963	1962	1961	1960
Fish Meal:					
Production:	(Short Tons)				
November	8,922	13,316	10,175	10,071	10,805
January-Nov. 2/	202,589	228,704	291,893	278,574	261,165
Year 3/	-	255,907	312,259	311,265	290,137
Imports:					
November	25,745	17,369	11,904	25,649	6,149
January-Nov. Year	401,320	346,592	233,330	194,577	115,997
	-	376,321	252,307	217,845	131,561
Fish Solubles:					
Production: 4/					
November	2,851	4,886	4,819	5,140	3,524
January-Nov. 2/	80,339	103,876	122,811	107,318	96,032
Year	-	107,402	124,649	112,254	98,929
Imports:					
November	176	171	435	3,649	282
January-Nov. Year	4,228	3,952	5,921	6,267	3,114
	-	7,112	6,308	6,739	3,174
Fish Oils:					
Production:					
November	6,778	10,089	8,254	10,257	12,070
January-Nov. 2/	164,863	179,433	249,385	246,927	201,406
Year	-	185,827	250,075	258,118	209,143
Exports:					
November	90	146	171	1,425	14,640
January-Nov. Year	140,349	229,080	122,878	112,002	127,852
	-	262,342	123,050	122,486	143,659

1/Preliminary.

2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.

3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reports monthly are included in annual totals.

4/Includes homogenized fish prior to 1964--none produced in 1964.

* * * * *

Production by Areas, December 1964: Preliminary data on U. S. production of fish meal, oil, and solubles for December 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International

U. S. Production 1/ of Fish Meal, Oil, and Solubles by Areas, December 1964 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
December 1964:			
East & Gulf Coasts . . .	5,092	5,428	1,722
West Coast 2/	1,503	330	1,009
Total	6,595	5,758	2,731
Jan -Dec. 1964			
Total	209,184	170,621	83,307
Jan. -Dec. 1963			
Total	229,646	184,009	89,000
1/Does not include crab meal, shrimp meal, and liver oils.			
2/Includes American Samoa and Puerto Rico.			

Association of Fish Meal Manufacturers are shown in the table.

* * * * *

Production, October 1964: During October 1964, a total of 5.3 million pounds of marine animal oils and 9,230 tons of fish meal was produced in the United States. Compared with October 1963 this was a decrease of 9.7 million pounds of marine animal oils and 9,039 tons of fish meal and scrap. Fish solubles production amounted to 4,824 tons--a decrease of 2,547 tons as compared with October 1963.

Menhaden oil production amounted to 3.8 million pounds--a decrease of 9.4 million pounds. Menhaden fish meal and scrap production in October 1964 amounted to 4,442 tons--a decrease of 7,756 tons as compared with the same month of 1963.

U. S. Production of Fish Meal, Oil, and Solubles, October 1964 1/ with Comparisons					
Product	1/1964	Oct. 1963	Jan.-Oct. 1/1964	1963	Total 1963
(Short Tons)					
Fish Meal and Scrap:					
Herring	662	862	9,987	7,492	7,537
Menhaden 2/	4,442	12,198	141,647	166,725	184,205
Tuna and mackerel	2,720	4,011	22,611	20,069	26,957
Unclassified	1,406	1,198	19,584	21,102	22,415
Total	9,230	18,269	193,829	215,388	241,114
Shellfish, marine-animal meal and scrap	3/	3/	3/	3/	14,793
Grand total meal and scrap	3/	3/	3/	3/	255,907
Fish solubles:					
Menhaden	2,636	4,787	60,777	69,284	74,831
Other	2,188	2,584	16,711	22,482	25,347
Total	4,824	7,371	77,488	91,766	100,178
Homogenized condensed fish	-	-	-	7,224	7,224
(1,000 Pounds)					
Oil, body:					
Herring	249	263	9,986	5,136	5,709
Menhaden 2/	3,819	13,198	137,443	153,098	167,635
Tuna and mackerel	851	951	4,912	4,773	5,903
Other (including whale)	349	567	5,744	6,337	6,580
Total oil	5,268	14,979	158,085	169,344	185,827
1/Preliminary data.					
2/Includes a small quantity of thread herring.					
3/Not available on a monthly basis.					

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U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January-October 1964: Based on domestic production and imports, the United States available

supply of fish meal for January-October 1964 amounted to 569,404 short tons--18,103 tons (or 3.3 percent) more than during January-October 1963. Domestic production was 21,559 tons (or 10.0 percent) less, but imports were 39,662 tons (or 11.8 percent) higher than in January-October 1963. Peru continued to lead other countries with shipments of 300,820 tons.

The United States supply of fish solubles during January-October 1964 amounted to 81,540 tons--a decrease of 20.4 percent as compared with the same period in 1963. Domestic production dropped 21.7 percent but imports of fish solubles increased 17.7 percent.

U. S. Supply of Fish Meal and Solubles,
January-October 1964 with Comparisons

Item	Jan.-Oct.		Total 1963
	1/1964	1963	
	. . . (Short Tons). . .		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	141,647	166,725	184,205
Tuna and mackerel	22,611	20,069	26,957
Herring	9,987	7,492	7,537
Other	19,584	21,102	22,415
Total production	193,829	215,388	241,114
Imports:			
Canada	46,754	43,735	50,925
Peru	300,820	257,087	291,544
Chile	11,302	23,197	24,249
Norway	-	1,819	1,819
So. Africa Republic	13,487	8,275	12,296
Other countries	3,212	1,800	2,274
Total imports	375,575	335,913	383,107
Available fish meal supply	569,404	551,301	624,221
Fish Solubles:			
Domestic production 2/	77,488	3/98,990	3/107,402
Imports:			
Canada	1,315	1,753	2,034
Iceland	-	55	160
So. Africa Republic	935	191	411
Other countries	1,802	1,443	4,168
Total imports	4,052	3,442	6,773
Available fish solubles supply	81,540	102,432	114,175

1/ Preliminary.
2/ 50-percent solids.
3/ Includes production of homogenized condensed fish.

1/Preliminary.

2/50-percent solids.

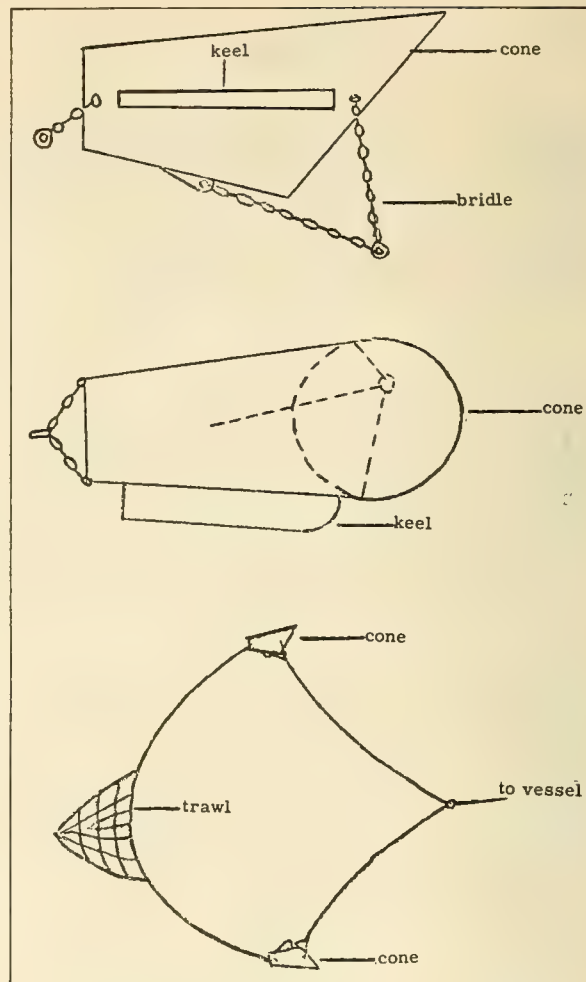
3/Includes production of homogenized condensed fish.



Inventions

TRAWLING CONE THAT CAN SUBSTITUTE FOR OTTER BOARDS INVENTED IN DENMARK:

A device to hold open a floating trawl has been newly invented in Denmark where two-vessel trawling is practiced. The new invention will hold open a floating trawl when towed by only one vessel, according to the inventor. The new invention is an open-ended, cone-shaped device which supplants the usual otter boards on each side of the trawl.



The forward end of the cone is cut at a backward angle while the rear end is square. The cone has a keel underneath with a rounded front edge to prevent the cone from digging into the bottom when the trawl is fished near the bottom. A vertical bridle attaches the rear end of the cone to a cable leading to the trawl. Front bridles are attached to the forward end of the cones and then to cables which lead to a single cable to the towing vessel. The depth of the trawl is adjusted by letting out or hauling in the single cable.

In operation, the water passing through the cones keeps them separated and the trawl open. The stream of water directed back through the cones toward the trawl is expected to increase the catch when passing through a school of fish. Patent and model protection have been sought in Denmark for the device.

The inventor of the device is Hartman Fynbo, Holstvej 8, Skagen, Denmark. Since he is a tinsmith, his first models have been constructed of metal. However, his patent application states the cones may be made of collapsible material such as canvas or plastic cloth. There have been no reports of the device being used commercially. The inventor has said that a special trawl should be used with the cones, and that such a trawl is being constructed.

The Danish patent application for the device is number 3221 and was made July 6, 1963. Protection for the model of the device was sought June 21, 1963, and given registration number 39,490 by Direktoratet for Patent-og Varemaerkevaesenet, Nyropsgade 45, Copenhagen V, Denmark. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, December 22, 1964.)



New Jersey

FISHERIES, 1963:

Summary: Landings of commercial fish and shellfish in New Jersey during 1963 were 255.2 million pounds with a value of \$10.2 million ex-vessel--a decrease of 191.7 million pounds (43 percent) and \$1.6 million (13 percent) from 1962. Menhaden was down 196.7 million pounds, and scup or porgy was down 2.1 million pounds. Appreciable increases occurred for surf clams, which were up 7.7 million pounds, and bluefin tuna up 2.8 million pounds.

Menhaden made up 70 percent, surf clams 15 percent, scup 5 percent, and 4 species combined (fluke, whiting, bluefin tuna, and sea bass) 5 percent of the 1963 New Jersey catch.

Following are some of the highlights of the New Jersey fisheries during 1963:

New Jersey Fishery Landings, 1962-1963

Species	1963		1962	
	Quantity Pounds	Value Dollars	Quantity Pounds	Value Dollars
Fish:				
Bluefish	822,219	97,132	1,091,600	118,871
Butterfish	1,385,964	125,349	2,112,700	161,452
Cod	1,238,987	161,464	1,483,900	174,750
Fluke	4,444,861	1,046,138	4,749,200	973,107
Menhaden	178,816,346	2,184,960	375,526,600	3,901,547
Scup or porgy	12,730,355	1,066,987	14,878,900	994,411
Sea bass	2,811,754	333,619	2,621,400	341,943
Striped bass	743,251	104,767	493,800	91,304
Swordfish	192,796	89,510	26,200	15,838
Tuna, bluefin	2,827,635	155,462	5,400	747
Whiting	3,408,407	142,860	3,912,500	156,781
Other fish	2,595,058	275,488	3,180,400	234,437
Total fish	212,017,633	5,694,226	410,082,600	7,165,188
Shellfish, etc:				
Crabs:				
Blue:				
Hard	828,500	99,503	1,505,000	139,692
Soft	33,150	6,630	155,500	31,088
Rock	22,767	712	22,000	892
Horseshoe	201,200	1,007	340,000	1,938
Lobsters	750,303	336,753	870,900	368,645
Clams:				
Hard	1,555,420	642,878	1,339,700	536,335
Soft	15,252	6,355	17,400	7,210
Surf	37,548,411	2,580,151	29,830,200	1,917,518
Conchs	524,053	112,242	166,200	22,680
Oysters 1/	485,365	518,183	1,553,400	1,422,234
Scallops:				
Bay	273,886	112,170	364,700	129,438
Sea	173,412	83,110	97,300	37,124
Shrimp	2/	2/	7,300	7,300
Squid	795,703	41,674	544,100	32,450
Terrapin, Diamond-back	2/	2/	3,200	1,120
Turtles	2/	2/	29,700	3,508
Total Shellfish, etc.	43,207,422	4,541,368	36,846,600	4,659,172
Grand Total	255,225,055	10,235,594	446,929,200	11,824,360

1/Does not include production taken from waters of Delaware.

2/Not available.

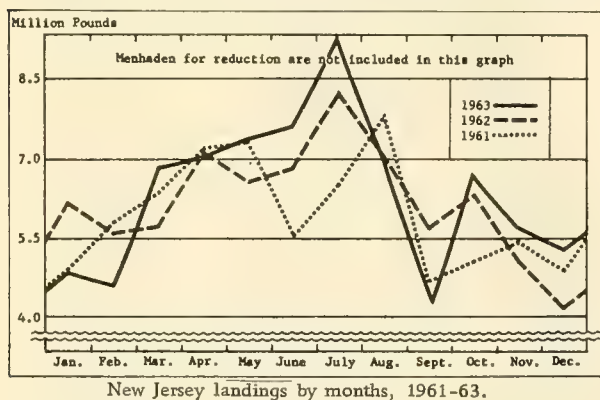
Note: Data for 1962 are revised. Univalve and bivalve mollusks are reported in pounds of meats. All other species are shown in round weight.

Tuna: For the first time in New Jersey's history tuna was landed in commercial quantities at the ports of Jersey City and Cape May. The tuna landings were made in 1963 by purse seiners from Massachusetts and California.

Striped Bass: Setting a record in 1963, striped bass landings totaled 743,000 pounds. Otter-trawl gear was credited with most of the catch during November and December, the period of peak production. New Jersey fishermen first took significant quantities of striped bass in otter trawls during 1961. Since that time striped bass catches by otter-trawl gear have increased each year.

Sea Bass: The catch of sea bass by pot operators in 1963 increased over 1962. The best catches occurred during the months of May and June. The catch in those 2 months accounted for more than 50 percent of the total production for the season which ended in the fall. The price for "pot" sea bass held up well during the peak months because the fish were of unusually good quality and size. Otter-trawl operators were also pleased with their catch of sea bass during the months of February, March, and December.

Swordfish: Seven vessels from New Jersey entered the long-line fishery for swordfish in 1963. Their first swordfish catches were landed during April 1963 at Hampton, Va., because that port was close to the fishing grounds. Starting in May 1963, the vessels landed all their swordfish at New Jersey ports. The majority of those vessels stopped long-lining in July and returned to otter-trawl fishing due to the drop in swordfish prices.



Surf Clams: The record surf-clam catch in 1963 exceeded the 1962 catch by almost 8 million pounds of surf clam meats. The best catch for a 1-month period was the 4 million

pounds taken in October 1963. Six vessels were added to the surf clam fleet in 1963. Early in the year surf-clam grounds previously unexploited were located off the Jersey coast. The acceptance of clam products by consumers has led to a steady increase in the surf-clam catch during the last 10 years.

Conch: Landings of conch are becoming more prominent. Various canners and bait establishments have reported an increased demand for conch meat. Inshore-boat operators have turned to the conch fishery during periods when other species have been scarce.

Squid: The New Jersey squid catch is taken mainly by offshore draggers during early spring and late fall along with more valuable catches of other species. No vessel specifically fishes for squid, yet the 1963 squid landings in New Jersey were the largest in 14 years. There is no explanation that can be given for the increase, except fishermen caught more squid while fishing for fluke.

Hard Clams: Production of hard clams in New Jersey during 1963 was up 21,683 bushels from the previous year. In general, there was a good demand for hard clams all year. (C. F. S. No. 3484, New Jersey Landings, 1963, U. S. Bureau of Commercial Fisheries.)



New York

FROZEN FOOD REGULATIONS POSTPONED:

Proposed regulations by the State of New York on the manufacture, storage, and distribution of frozen foods have been postponed by that State's Commissioner of Agriculture and Markets. The reason for the postponement, after public hearings were held, was that the Commissioner was not satisfied that the regulations should be put into effect at this time. Further investigation and conferences among State officials and affected industries are planned.



North American Fisheries Conference

FUTURE OF FISHERIES TO BE DISCUSSED AT FIRST CONFERENCE:

"The Future of North American Fisheries Resources" will be the subject of the first general session of the North American Fisheries Conference, to be held in Washington, D. C., April 30-May 5, 1965, at the Mayflow Hotel.

Robert J. Gruber, president of the National Fisheries Institute (NFI)--the host association--will preside at the Monday morning (May 3) meeting of the Conference. It will mark the first time in history that Canadian, Mexican, and United States fishery associations have ever held a joint convention. E. A. Ruthford, who is first vice-president of NFI, is chairman of the panel of speakers. Included among the speakers are Dr. W. M. Chapman, president of the Van Camp Foundation, San Diego, whose subject is "North American Fishery Potential"; Dr. John L. Kask, director of the Inter-American Tropical Tuna Commission, La Jolla, Calif., who will ask "whether or not the North American resource is being properly managed and developed"; and Dr. Peter A. Larkin, director of the Biological Station, Fisheries Research Board of Canada, Nanaimo, B. C., who will provide the answers.

All speakers are internationally known and have had the broad education and experience which make them experts in their fields. Dr. Chapman, who has been director of the School of Fisheries, University of Washington, Seattle, and first special assistant to the Under Secretary of State for Fish and Wildlife, is a member of many advisory committees and is chairman of the Panel on Law of the Sea, Committee on Oceanography, National Academy of Sciences.

Dr. Kask is the former chairman of the Fisheries Research Board of Canada and before that was assistant director of the U. S. Fish and Wildlife Service. He has also been a member of the International Commission for the Northwest Atlantic Fisheries, the International Halibut Commission, and assistant director of the International Sockeye Salmon Commission.

Dr. Larkin is a former professor of the Department of Zoology and director of the Institute of Fisheries, University of British Columbia.

Delegates to the North American Fisheries Conference will be members of the Fisheries Council of Canada; the Camara Nacional de la Industria Pesquera, Mexico; and the National Fisheries Institute of the United States. The joint meeting will commemorate the 20th anniversaries of the Canadian and United States trade associations and the 14th anniversary of the Camara. Heading the delegations will be Donovan F. Miller, president of the Canadian organization, Elias Selem Curi, president of the Camara, and R. J. Gruber of NFI.

Technology Sessions planned by the National Fisheries Institute Quality Committee and the Smoked and Cured Fish Committee will be held on the opening day of the convention. Experts in five fields will participate at the Technology Session. Special speakers at the Smoked and Cured Fish Session will include the chief of the Bacteriological Branch, Division of Microbiology, U. S. Food and Drug Administration. The sessions will be open to all Conference participants.

Note: See Commercial Fisheries Review, December 1964 p. 70.



North Atlantic

FOREIGN FISHING ACTIVITIES OFF COAST, JANUARY 1965:

In order to observe foreign fishing activities in the North Atlantic, the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Foreign fishing vessel activity during January 1965 increased slightly over the previous month. A total of 26 Soviet vessels were sighted during the month and identified as 17 fish-factory stern trawlers, 4 refrigerated fish transports, 2 fuel and water carriers, 1 tug, and 2 side trawlers. During the previous months in December 1964 there were 20 vessels and in January a year earlier there were 19 vessels of similar types operating in the area covered.

Fishing operations of the vessels observed were generally confined south and southeast of the Nantucket Lightship along the Continental Shelf between Veatch and Hydrographer Canyons. But several of the transport

ships and support vessels were seen south and east of Nantucket Island.

It was noted that very large quantities of fish overflowed the open deck storage areas of each vessel. Trawls were bulging with fish catches estimated at 30,000 to 40,000 pounds. Visual examination and photographs confirmed that both whiting and red hake (also called mud hake) were being caught, with red hake appearing to be the predominant species.

The vessels' dehydration plants in full operation seemed to indicate that fish in excess of their processing facilities were being reduced to fish meal. How much red hake is being used for that purpose is not known.

The large quantities of fish seen in January were more than has been observed since the Soviet's intensive herring operation on Georges Bank in September 1964. By the end of the month about 6 Soviet vessels were reported operating along the mid-Atlantic coast areas.



North Atlantic Fisheries Investigations

FALL DISTRIBUTION AND ABUNDANCE OF GROUND FISH SPECIES STUDIED:

M/V "Albatross IV" Cruise 64-13 (October 22-November 25, 1964): To determine

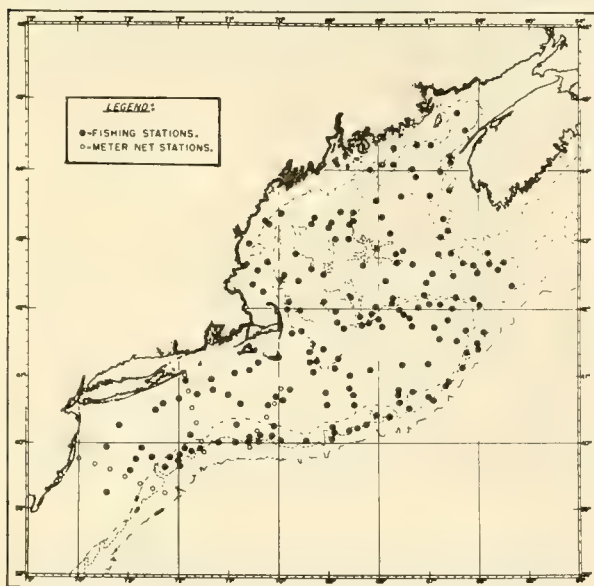


Fig. 1 - Shows fishing stations worked during Albatross IV Cruise 64-13 (October 22-November 25, 1964).

the fall distribution and relative abundance of groundfish species from the Bay of Fundy southward to Hudson Canyon was the purpose of this survey by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

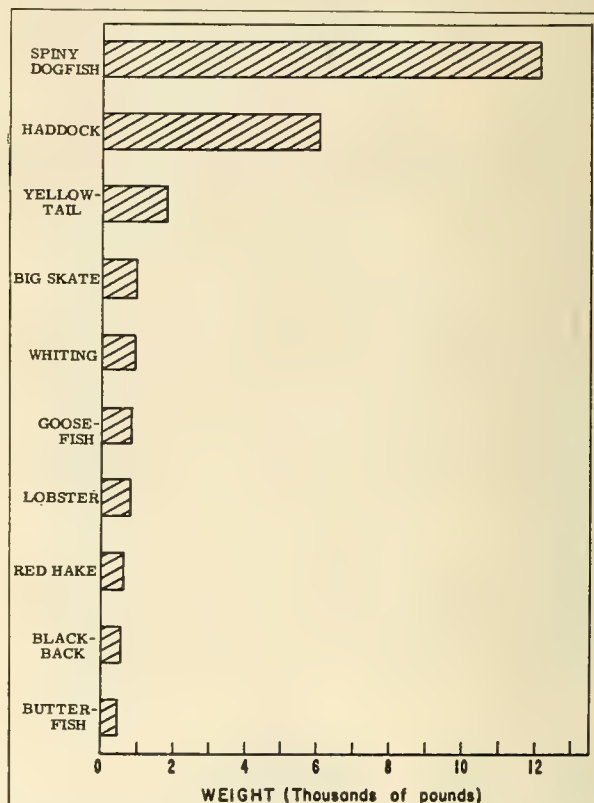


Fig. 2 - Total catch of most abundant species by weight caught during Albatross IV Cruise 64-13 (October 22-November 25, 1964).

A total of 185 groundfish stations was occupied on this cruise. All fish were identified and measured and the total weight by species was obtained from each tow. Stomach contents from a variety of groundfish species caught throughout the area were examined and recorded. Scale samples were taken from haddock and yellowtail flounders; otoliths were extracted from whiting (silver hake), squirrel hake, and white hake; blood samples were collected from selected groundfish species. Invertebrates taken in each tow were preserved. A sample of the bottom type was collected at each station. Selected groundfish species were preserved for special reference collections at the University of Maryland and Auburn University. Bathythermograph (BT) casts were made at all stations and every 10 miles between stations.

In the southern New England area, three plankton transects were made to obtain fluke eggs for the fluke program; conducted by marine biologists of the State of New Jersey.

Haddock 23 to 36 centimeters (13 to 14.2 inches) long (the 1963-year class) were caught in good quantities on Georges Bank and in the South Channel off Nantucket from depths of 30 to 50 fathoms. But the catches of the 1964-year class of haddock were low. A forecast of the influence of the 1964 year-class on future commercial landings was to be made after all the data were analyzed. Generally, catches of whiting (silver hake) were low as compared with previous years. Several good catches of ocean perch (redfish) were made in the deep waters of the Gulf of Maine. Spiny dogfish were taken in general throughout the survey area. In one tow off southern New England, over 6,000 pounds of spiny dogfish were caught in the net.

The total weight of all species caught on this survey amounted to 54,000 pounds. Spiny dogfish and haddock were at the top of the 10 most abundant species (by weight) caught during the survey.

Note: See Commercial Fisheries Review, November 1964 p. 44.



Oceanography

CONFERENCE AND EXHIBIT TO BE HELD IN WASHINGTON, D. C.:

The National Conference/Exposition on Ocean Science and Ocean Engineering will be held on June 14-17, 1965, in Washington, D.C. The meeting is cosponsored by the American Society of Limnology and Oceanography and the Marine Technology Society.

The Conference will be the first national meeting on the relation of ocean science and engineering. It will explore the role of marine technology and science in man's coming need to use intelligently the resources of the sea.

The Conference will hear a discussion of marine mineral resources. There will also be symposiums on the "Results of International Indian Ocean Expeditions"; "Navy Requirements in Oceanography"; and "Perspectives in Ocean Engineering."

A wide field of technical subjects will be discussed during the 3-day Conference. Some of the subjects are underwater research vehicles, oceanographic data-gathering techniques, instrumentation calibration and standardization, desalination, and fish farming. Other topics to be examined include water pollution control, nuclear power and the ocean, and undersea transport and storage.

A highlight of the Conference will be an exhibit of oceanographic equipment, services, vessels, and accessories. It will be the first time many of the products have been on public display, and the exhibit will be the largest oceanographic exposition ever presented.

* * * * *

"SOUND PICTURES" OF FISH SCHOOLS MAY BE POSSIBLE WITH IMPROVED ECHO-SOUNDER:

Work is under way to develop an echo-sounder accurate enough to tell an albacore from a skipjack tuna. The project is under the direction of the La Jolla (Calif.) Tuna Resources Laboratory of the U. S. Bureau of Commercial Fisheries.

A 60-foot vessel on loan from the Navy is being outfitted with special echo-sounding equipment developed by a California firm. The vessel is expected to begin testing the equipment in the spring of 1965. It will operate in the coastal waters of California.

The special sonar equipment developed for the test will employ continuous frequency-modulated sound transmission in contrast with the conventional-type sonar which sends out periodic sound waves and then stops until the echoes return from a object. A complex sound analyzer is being built to sort out the continuous sound returns and classify them. The sound returns will be displayed continuously on a cathode ray tube. The new equipment is designed to enable fishermen to tell a school of yellowfin tuna from a school of bonito, or a school of anchovy from a mass of mackerel.

For practical use, it will be necessary to extend the range of the new echo-sounder far enough to give it an advantage over visual spotting from the masthead of a vessel. The new sonar could be especially valuable for night fishing. Visual spotting is possible only on dark nights when a school of tuna, anchovy, or other fish can be seen from the

white froth or phosphorescence created by the beat of their tails in the sea.

* * * * *

NEW METHOD OF EXTRACTING RADIOACTIVE SILICON FROM SEA WATER:

A new technique for measuring naturally occurring radioactive silicon in the oceans' water should help oceanographers who are trying to chart the circulatory and mixing patterns of the seas' depths, an assistant research professor of oceanography at the University of Rhode Island announced November 21, 1964. He reported that he had successfully developed and tested a method whereby he is able to remove some 2 ounces of silicon from more than 40 tons of sea water taken from various selected depths.



Fig. 1 - Shows water sampling bag hauled aboard research vessel Trident.

About 10 out of every billion, billion atoms in this sample is radioactive Silicon-32, an isotope of the element which is formed by cosmic rays bombarding the upper atmosphere. (Isotopes are chemically similar forms of the same element which vary in weight.) Since the rate at which Silicon-32 decays is known within broad limits, the scientist's measurements give an indication of the "age" and the movements of the ocean waters. Expansion of such knowledge is vital to scientists who are concerned about the dispersal of radioactive wastes in the oceans, the scientist explained. In addition, the U. S. Navy, which is supporting his work through the Office of Naval Research, is interested in his findings.

While Carbon-14 is admittedly the best radioactive tracer for sea water, its rate of decay or half-life, he believes, is too long (half a given quantity decays in 5,700 years) in terms of the process being studied. Although it never has been accurately measured, Silicon-32 has a half-life somewhere near 300 years. This is more in line with the estimates that it takes a particle of sea water about a thousand years to complete its cycle into the depths and back again.

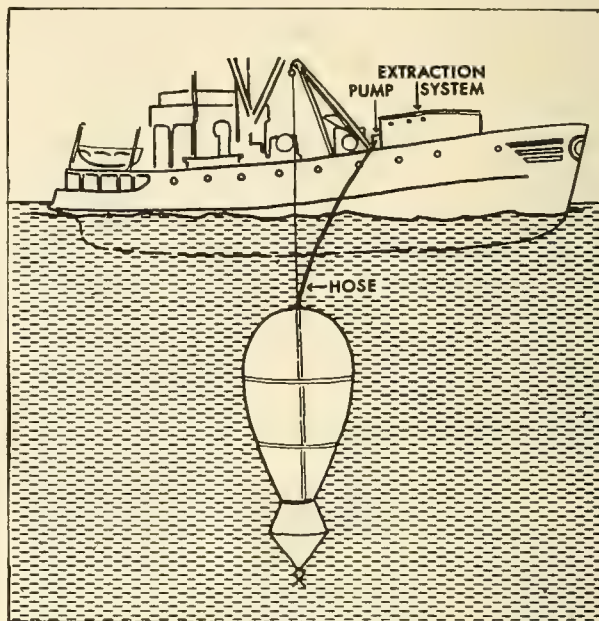


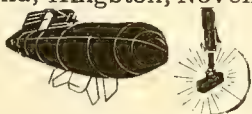
Fig. 2 - Artist's drawing shows how water sampling bag is operated.

The key item used by the scientist in his process is what is considered to be the world's largest bag water sampler, capable of collecting 10,000 gallons of water at one time. The rubberized-nylon bag is lowered empty into the water using a large shipboard winch and A-frame. At a pre-set depth a hydrostatic device opens the nine-foot mouth of the bag. As it starts to come up, water gushes through a 15-foot neck or funnel into the bag itself which is nearly 28-feet long.

When filled, the bag turns over to disengage the funnel and is hoisted to within 50 feet of the ocean's surface. Here a suction hose and pump run the collected water through an extraction system where the silicon--in the form of dissolved silica--is captured or scavenged out, using a specially treated ion-exchange resin. Silica is a common constituent of beach sand.

After treatment aboard the vessel with hydrochloric acid and distilled water, the resin yields some 150 gallons of solution which is stored aboard the University of Rhode Island research vessel Trident until returned to the University's laboratory facilities at Narragansett Bay. The radioactivity of the minute quantities of material eventually obtained is measured in a Geiger counter. (Actually Silicon-32 decays to form Phosphorous-32, a radioactive "daughter" which can be handled easily chemically and counted.)

Originally, Silicon-32 is formed on the borders of space when high-energy cosmic rays--nature's own atom smashers--strike the nucleus of Argon, creating atomic fragments some of which are Silicon-32. Argon is an inactive gas which forms a little less than one per cent of the earth's atmosphere. The atmosphere's Silicon-32 is washed to the sea's surface by rainfall and then begins the mixing process. (Press release, University of Rhode Island, Kingston, November 22, 1964.)



Salmon

RETURNS TO LOWER COLUMBIA RIVER HATCHERIES IN 1964 REPORTED EXCELLENT:

Returns of fall chinook and silver salmon in 1964 to U. S. Bureau of Sport Fisheries and Wildlife and State operated hatcheries located on the lower Columbia River and its tributaries were considered the best in years. The fall chinook egg-take at the Spring Creek National Fish Hatchery in Washington alone totaled more than 45 million. Other hatcheries operated by the state and Federal governments reported excellent takes of chinook and silver salmon eggs and holding ponds crowded with additional, unstripped silvers. Many adult fish were released above hatchery facilities or carried to other streams for natural spawning.

* * * * *

SALMON SANDWICH BIG HIT AT NEW YORK WORLD'S FAIR:

A salmon sandwich was the most popular of 16 sandwiches sold at the World's Fair booth of a soft drink firm, according to the Association of Pacific Fisheries.



Sea Lamprey

GREAT LAKES FISHERY COMMISSION COMMENDED FOR RESULTS OF ERADICATION PROGRAM:

The Great Lakes Fishery Commission was commended on January 4, 1965, by Secretary of the Interior Stewart L. Udall for the progress made by Canada and the United States toward controlling the predations of sea lampreys on commercial and sport fish species in the Great Lakes.

Secretary Udall noted that the Commission (made up of three members from each country) has reported that sea lampreys in Lake Superior have been reduced 80 percent following treatment of tributary streams by selective chemicals which kill the young lamprey. Progress has been so encouraging that the Commission now has recommended that its research agencies study the desirability of permitting a limited commercial lake trout fishery in Lake Superior in the near future. Secretary Udall also endorsed the Commission's action in directing its scientists to continue seeking more effective, but less expensive chemicals which will kill only the young lampreys and then dissipate rapidly in the water without contributing to water pollution.

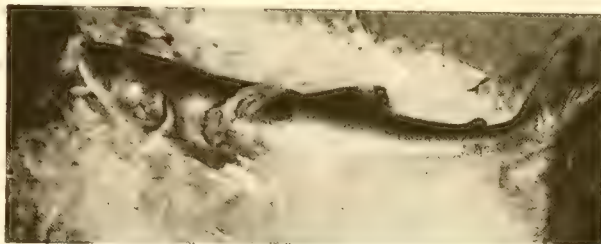


Fig. 1 - Lake trout in a bed of ice with a sea lamprey wound.

Efforts to control the sea lamprey by selective chemicals have centered around Lake Superior since Canada and the United States began the joint chemical control program in 1958. At that time some lake trout remained in Lake Superior, but commercial catches in Lakes Huron and Michigan were only a fraction of 1 percent of what they were during 1930-39 when about 5 million pounds were taken from each of the two lakes. Lamprey control treatments were extended recently to Lake Michigan, where the initial series will be completed by summer 1966.

Secretary Udall said, "The apparent success of the program in Lake Superior is most

encouraging. I congratulate the Commission members on their dedication to programs to restore the Great Lakes to their rightful place as a source of revenue to commercial fishermen and a haven for sportsmen of both countries."



Fig. 2 - Feeder mechanism that maintains critical level of selective toxicants in Great Lakes streams infested with sea lampreys. The chemicals introduced in the streams selectively kill the young lamprey.

The sea lamprey reached Lake Erie from Lake Ontario when the Welland Canal--a convenient route around Niagara Falls--was deepened between 1913 and 1918. Before then, the lamprey was believed to have been in Lake Ontario for thousands of years, but unable to enter Lake Erie because of the falls and unfavorable passage conditions before the canal was deepened.

The significance of sea lamprey in Lake Erie was not realized for some time, probably because their population was small and there was no noticeable effect on fishing. But when they reached Lake Huron, where conditions were more favorable, they increased rapidly and the threat to deep-water fish became apparent. Lake trout, rainbow trout, whitefish, suckers, and many other species were caught with round wounds, about three quarters of an inch across, made by the numerous sharp teeth of the lamprey which attaches itself on its victim and feeds on its blood. Lake trout bore the brunt of the

lamprey attacks and catches of trout went down first in Huron, then in Michigan, and finally in Lake Superior as the parasite multiplied in each of those lakes.

Before the invasion of the sea lamprey, lake trout were the mainstay of a flourishing and stable fishing industry with landings ranging from 14 to 17 million pounds a year in the upper Great Lakes. Fluctuation of populations made commercial fishing for other species profitable in some years, but lake trout was the backbone of the industry. When lake trout nearly disappeared, both sports fishermen and commercial fishermen lost a resource which had been receiving greater attention each year. In times past, thousands of outdoorsmen had spent millions of dollars annually on fishing and related hobbies in the lakes.

A realization that a united approach to the fisheries problem was desirable and necessary led to the establishment of the Great Lakes Fishery Commission by Canada and the United States in 1956. Since then, the Great Lakes States (New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin and Minnesota), the Province of Ontario, and the Governments of the United States and Canada combined efforts to control sea lampreys. The first step was a study of the life history of the sea lamprey in the Great Lakes, its spawning habits, migrations and growth, to discover at what stage in its development it could be most easily controlled. Sea lamprey migrate up streams in the spring and early summer and spawn in holes they make in a bottom of coarse gravel or sand. After spawning, the adults die. The eggs hatch in about 12 days, but several years pass before they leave a nonparasitic stage of life burrowed in sand and silt to migrate to the lakes and attack fish.

During the 12 to 20 months that adult sea lamprey spend in the lakes before re-entering the streams to spawn, they grow from about 7 inches to 17 inches. Laboratory observations have shown that a single lamprey may destroy 30 to 40 pounds of fish during the parasitic stage.

Note: See Commercial Fisheries Review, February 1964 p. 62.



South Atlantic Fisheries

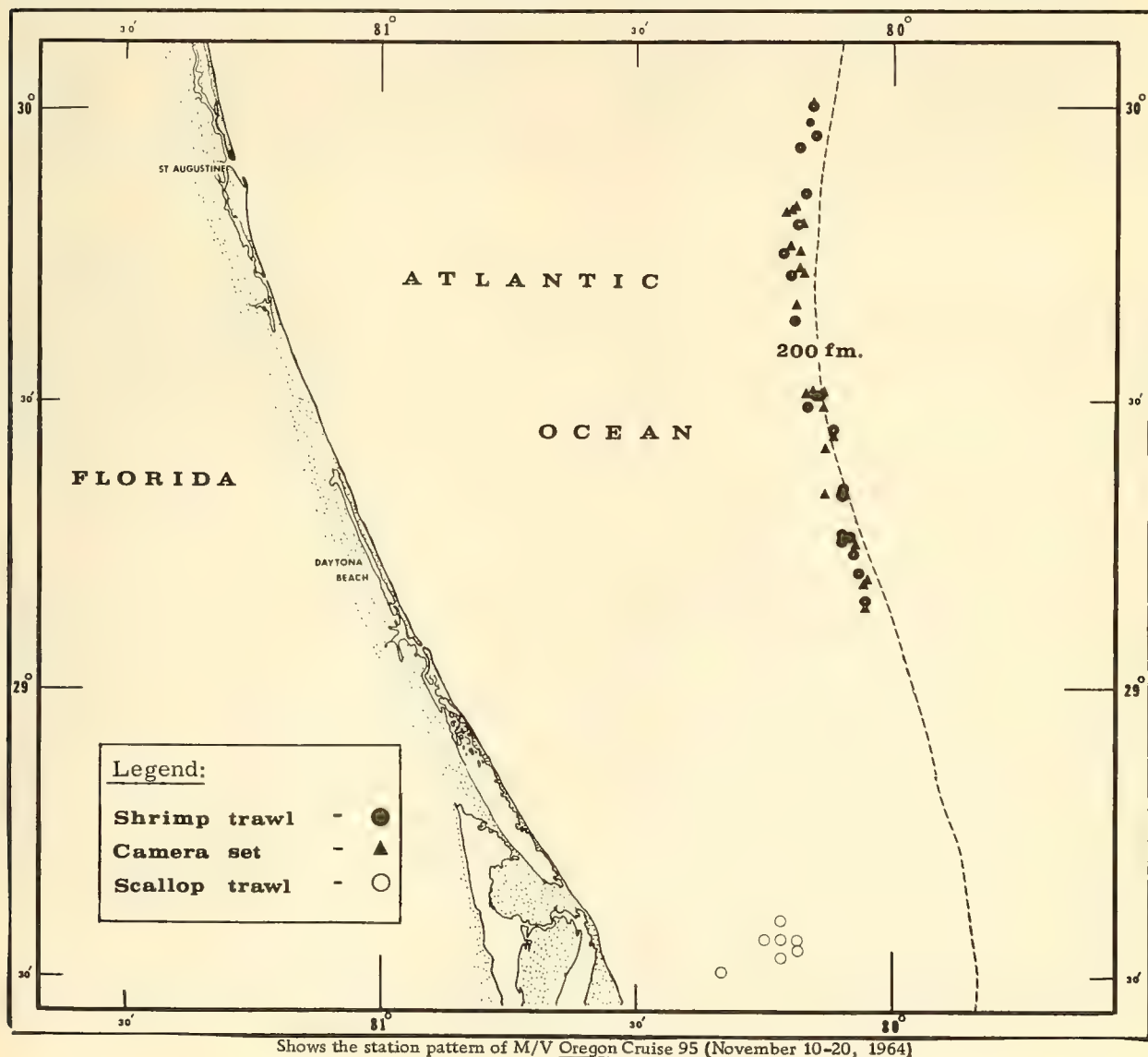
Exploration and Gear Research

USE OF CAMERA STUDIED TO FISH FOR ROYAL-RED SHRIMP AND CALICO SCALLOP:

M/V "Oregon" Cruise 95 (November 10-20, 1964): To obtain photographic observations of the fishing efficiency of 40-foot shrimp trawls working at 200-fathom depths and to obtain additional information on gear performance were the main objectives of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. The area of operations was on the royal-red

shrimp (Hymenopenaeus robustus) grounds off the Florida east coast extending from St. Augustine southward to below Daytona Beach.

A total of 43 trawl hauls was completed in depths of 177 to 225 fathoms, and a 40-foot flat trawl rigged with 6-foot chain doors was used for all drags. Slight modifications were required to position the motion picture camera over the headrope. Twenty-three drags were made without the camera gear to locate shrimp concentrations and check out bottom conditions; 20 drags were completed with the motion picture camera mounted on the headrope. A total of 3,200 feet of 16-millimeter motion picture film was exposed in the underwater



camera--2,400 feet of black and white, and 800 feet of color film.

Catches with and without the camera attached to the trawl yielded royal-red shrimp of mixed sizes of from 1 pound to 75 pounds an hour. There was no indication that the camera equipment impaired the fishing efficiency of the trawls.

A secondary objective of the cruise was to continue bottom reconnaissance studies using a CA-8 35 millimeter still camera in cooperation with the National Geographic Society, and to sample a segment of the calico scallop (*Pecten gibbus*) bed off Cape Kennedy. The lens port of the CA-8 camera cracked on the first set in 177 fathoms, which stopped further work during the cruise. Seven 30-minute scallop trawl drags were made off Cape Kennedy in 14 to 27 fathoms. Catches were

small, with the largest catch yielding about 250 scallops ranging in size from 50 to 55 millimeters (2.0 to 2.2 inches).

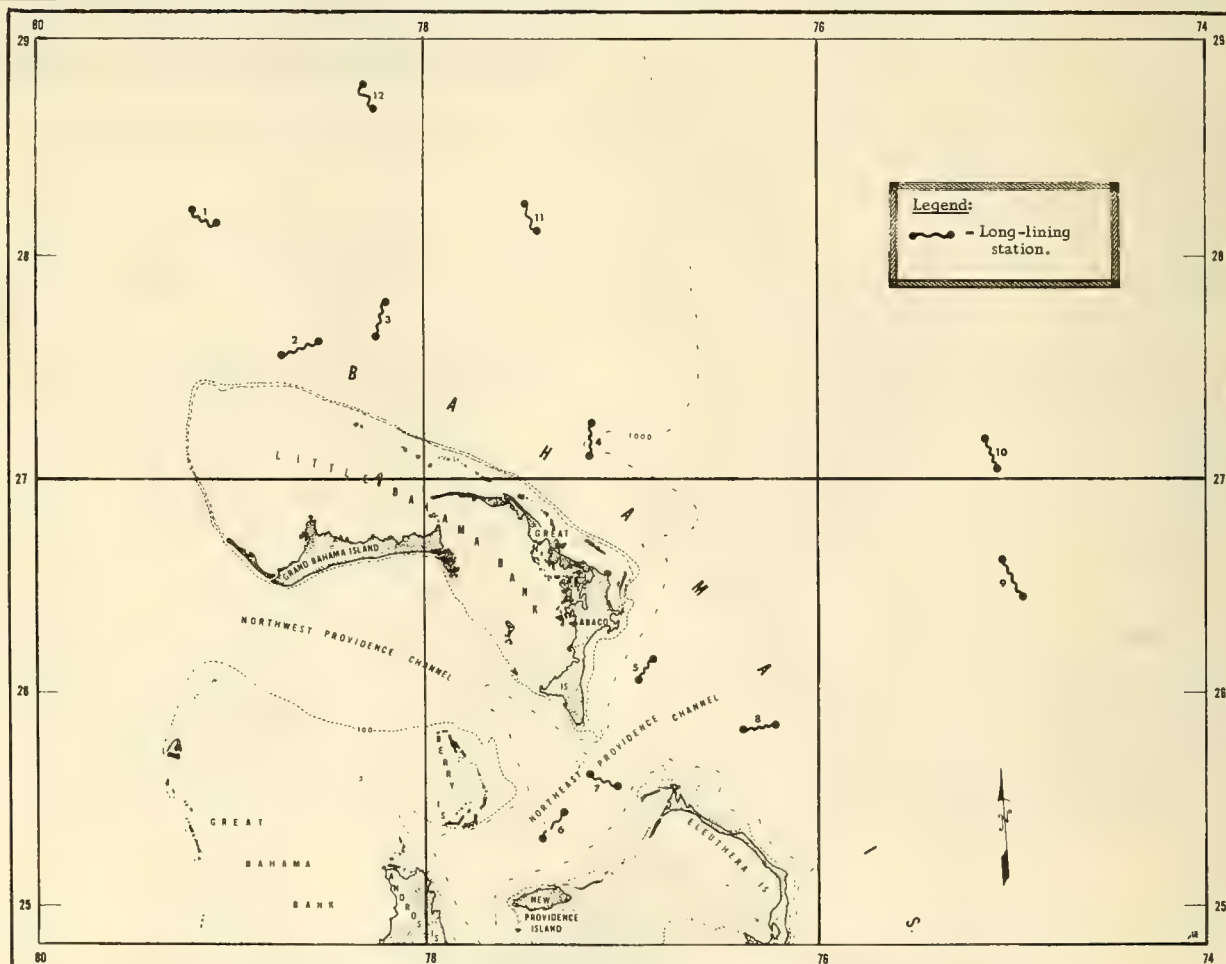
Note: See Commercial Fisheries Review, May 1964 p. 32.

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SEASONAL AVAILABILITY OF SWORDFISH AND TUNA INVESTIGATED:

M/V "Oregon" Cruise 96 (December 2-19, 1964): To conduct preliminary investigations on the seasonal availability of swordfish and tuna in the vicinity of Little Bahama Bank was the main objective of this 18-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon.

During the cruise, 12 long-line sets consisting of a total of 6,100 hooks were made over the Blake Plateau, near Little Bahama Bank and in the Antilles Current. One basket



Shows long-lining stations of Oregon Cruise 96 (December 2-19, 1964).

of gear consisted of a 138-fathom mainline with 10 gangions of two 4-fathom sections. Buoy-line lengths varied from 2 to 275 fathoms long. Squid and scad (*Decapterus*) were used for bait. The gear was usually set early in the evening and retrieved at mid-morning the next day.

Techniques were evolved for experimental deep-drop long-line fishing during the cruise. The gear was successfully fished with buoy-line lengths varying from 100 to 275 fathoms. But severe gangion twisting problems were encountered when hauling back baskets with drops greater than 100 fathoms. Buoy-line lengths and fishing effort, expressed as a percentage of the total number of hooks fished, were: 2 fathoms (4.9 percent); 5 fathoms (13.1 percent); 10 fathoms (14.8 percent); 20 fathoms (14.8 percent); 30 fathoms (14.8 percent); 50 fathoms (11.5 percent); 60 fathoms (2.4 percent); 100 fathoms (12.3 percent); 140 fathoms (4.8 percent); 190 fathoms (3.3 percent); and 275 fathoms (3.3 percent).

Bathythermograph and thermometer casts were made at all stations visited. The upper mixed layer of water was found to vary from 30 to 70 fathoms in depth and from 72° to 77° F. in temperature. Extremely warm water was found to great depth, as is characteristic of that region. In the Antilles current system east of Great Abaco Island, temperature depths were: 70° F.--105 fathoms; 65° F.--190 fathoms; 60° F.--255 fathoms; 55° F.--300 fathoms; 50° F.--335 fathoms. A similar gradient, but with even warmer temperatures was observed over the Blake Plateau.

Catch rates were low on all of the sets made; a total of 20 tuna and 6 swordfish (*Xiphias gladius*) was taken during the cruise. Species of tuna caught were big-eyed (*Thunnus obesus*), yellowfin (*T. albacares*), albacore (*T. alagunga*), and skipjack (*Katsuwonus pelamis*). Best catches from 4 sets were made over the Blake Plateau. Aside from one station in the Antilles Current, the remaining catches were dominated by silky and oceanic white-tip shark (*Carcharhinus falciformis*) and *C. longimanus*. Of the 6 swordfish caught on this cruise, 3 were taken on baskets with 100-fathom buoy lines.

Tuna and swordfish catch rates for the various buoy-line lengths, expressed as number of fish taken per 100 hooks, were: 2 fathoms--0.07; 5 fathoms--0.73; 10 fathoms--0.44; 20 fathoms--0.33; 30 fathoms--0.33; 50 fathoms--

0.13; 60 fathoms--0.00; 100 fathoms--0.80; 140 fathoms--0.33; 190 fathoms--0.00; and 275 fathoms--0.00. Although the number of fish caught and amount of fishing time during the cruise was low, indications were that highest catch rates were made on baskets with 100, 5- and 2-fathom buoy lines, respectively. The 100-fathom baskets also yielded the greatest poundage of fish per unit of effort: 85 pounds per 100 hooks as compared to 42 pounds per 100 hooks for the 140 fathom baskets, and 40 pounds per 100 hooks for the 5-fathom baskets. Catch rates for the remaining baskets were less than 25 pounds per 100 hooks.

On this cruise, 20 dip-net and nekton ring-net stations were also occupied to collect juvenile and adult pelagic fish species, in cooperation with biologists of the U. S. Bureau of Commercial Fisheries.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, OCTOBER-DECEMBER 1964:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for October-December 1964, follows:

Oyster Studies: In October 1964 a sand-filtering system was installed which filtered all the salt water pumped into the 12 x 12 foot experimental tanks. Studies on the feeding of oysters have been carried on in the tanks since 1963. Filtering changed the water quality supplied to the tanks and presumably as a result of this, changes were noted in the growth of oysters being studied.

Five sets of underwater weights were made from mid-October through December on 32 oysters kept in one of the experimental tanks which received only filtered water. Those oysters experienced an overall weight loss of 0.993 percent. During the same period of time a similar group of weights were obtained on 33 oysters held in another tank but those oysters received filtered water fortified with hydrolyzed rice. These oysters gained 1.03 percent. Thus fed oysters (as in previous experiments) gained more weight than unfed oysters.

A group of oysters comparable in size were held in trays under the dock in We Creek

(the main source of salt water for ponds and tanks at Bears Bluff). Four sets of underwater weights were available for those oysters. They showed that the oysters in that environment gained 1.06 percent in total weight. Thus oysters in unfiltered water gained considerably more than those held in filtered water and in fact gained a fraction of a percent more than oysters held in filtered water fortified with carbohydrate food.

Studies have commenced to retest the results.

Shrimp Studies: Experimental otter trawling and plankton sampling throughout coastal waters continued on schedule during October-December 1964. Earlier in the year, experimental plankton tows indicated a scarcity of postlarval white shrimp in inshore waters, and it was predicted that the 1964 commercial catch of white shrimp would be below normal. Generally the predictions have proven correct, and although the commercial catch for white shrimp was greater in 1964 than in 1963, the harvest was far from normal.

Postlarval white shrimp continued to enter coastal waters until mid-October, but did not reach any great peak of abundance during the recruitment period. A moderate increase in the numbers of those postlarvae as well as postlarvae of the spotted shrimp was, however, noted in mid-September through early October. This was rather unusual for that time of year. Those postlarvae entered too late to be of significance commercially. By December they had reached a length of only $2\frac{1}{2}$ - $4\frac{1}{2}$ inches, but experimental trawling indicated that those small shrimp were fairly plentiful in inshore waters during December.

According to experimental tows, white shrimp were slightly more plentiful in coastal waters during October-December of 1964 as compared with that period of 1963. Brown shrimp, usually not abundant during that time of year, were caught in greater numbers that quarter than in that of 1963, and unusual numbers of juvenile brown shrimp were noted in most rivers and sounds during November.

Although it is too far in advance for predictions as to the commercial shrimp catch for 1965, the abundance of juvenile shrimp during November and December is somewhat encouraging. If the winter is mild and the

small shrimp now present in coastal waters survive until spring to spawn, the commercial crop of shrimp for 1965 should be better.

Data obtained from experimental otter trawling during the quarter indicated that croaker were slightly less plentiful in 1964 than during the same period in 1963. Spot also declined somewhat in abundance as compared with the last quarter of 1963.

Pond Cultivation: Several experiments in pond cultivation were concluded during October and November. Two one-acre ponds, two one-quarter-acre ponds, and several smaller ponds were drained and harvested. Best results were had in the smaller experiments, chiefly because supplies of postlarval and juvenile shrimp for pond stocking were scarce in nearby waters and inadequate numbers were obtained for large-scale projects. Heavy rainfall (30 inches in July) resulted in below normal growth and above normal mortality in the experimental shrimp.

In one experiment in a $\frac{1}{10}$ -acre pond, 868 small (3-4 inch) shrimp were stocked between June and September. That pond was treated with rotenone in July and traps were used to remove crabs. The shrimp in that pond were fed a total of 138 pounds of chopped crab and fish during the growing period, an equivalent of over 1,300 pounds per acre. Over 27 pounds of shrimp were harvested from that small pond when it was drained on October 16, 1964, the equivalent of almost 300 pounds per acre.

In another experiment using a 12 x 12 foot concrete tank, the bottom of which was covered with pond mud, 2.5 pounds of shrimp were harvested on October 12 when the tank was drained. This is the equivalent of about 800 pounds per acre. The tank had been stocked with postlarval shrimp beginning in March and continuing through August. Shrimp in the tank were fed an equivalent of over 3,000 pounds per acre of chopped trash fish and crabs.

The one-acre "Oyster Pond" was stocked with about 850 juvenile brown shrimp during May-August and only 43 pounds 4 ounces of shrimp were harvested when the pond was drained on October 14. Mortality in that pond was high and the shrimp were much smaller than normal for that time of year. The shrimp in that pond had been fed several hundred pounds of chopped fish and crabs. Low sa-

linity due to excessive rainfall apparently greatly impeded their growth.

The other one-acre pond at Bears Bluff also yielded a low harvest of shrimp when it was drained on October 19, 1964. This pond had been allowed to stock naturally by the tidal flow of water into it from the nearby creek during March and April and again in July and August. Only about 23 pounds of shrimp were harvested, reflecting the scarcity of shrimp in nearby waters. Those shrimp also were much smaller in size than usual, again chiefly because of low salinities during the culture period.

The two one-quarter acre ponds, which were harvested on November 5 and 6, had been stocked in March 1964 with fish chiefly juvenile winter trout, channel bass, spot, croaker, and flounder. Forage shrimp and fish were also stocked in those ponds, and food in the form of chopped crabs and fish was introduced at regular intervals during the experiment. Survival and growth rates were good in both ponds. Over 60 percent of the fish stocked were harvested and many had increased in length by as much as six inches. Those experiments indicate the feasibility of using salt-water ponds for food and game fish.

Fish Kill: One small fish-kill occurred in the Ashley River beginning on November 18. Fresh water catfish, striped bass, croaker, spot, and menhaden were found dead and dying. Dead fish were observed over a three-day period along the river from Magnolia Gardens to the Municipal Yacht Basin. A survey crew from Bears Bluff collected water samples and dead fish on November 19. Those samples were turned over to the South Carolina Water Pollution Control Authority, for determination as to the cause of the kill.



Texas

FISHERIES, 1963:

Summary: Landings of fish and shellfish at Texas ports during 1963 totaled 166.3 million pounds valued at \$30.1 million ex-vessel sel--a decrease of 3 percent in quantity and less than 1 percent in value from 1962. The leading species landed in Texas during 1963 were menhaden 83.7 million pounds, shrimp (heads-on) 70.2 million pounds, blue crab 3.0 million pounds, oysters 2.6 million pounds, and

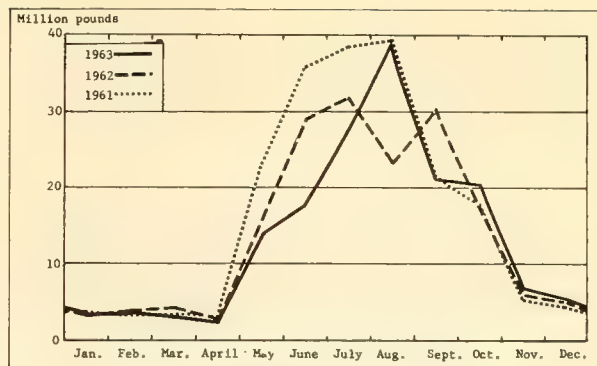


Fig. 1 - Texas landings by months, 1961-63.

red snapper 2.2 million pounds. Those 5 species accounted for 97 percent of Texas fishery landings in 1963.

Shrimp: Domestic landings of headless shrimp at Texas ports in 1963 were 44.1 million pounds (70.2 million pounds, heads-on) with an ex-vessel value of \$26.6 million. That was well above the 35.2 million pounds of heads-off shrimp landed in 1962, but below the \$27.1 million received for the 1962 catch. Texas ports accounted for 34 percent of the quantity and 42 percent of the ex-vessel value of all domestic shrimp landings in the Gulf States during 1963.



Fig. 2 - Shrimp conveyor unloader at Aransas Pass, Tex.

Shrimp vessels based at Texas ports during 1963 included 1,419 commercial trawl vessels (craft of 5 net tons and over) and 919 smaller craft. Those craft worked a total of 3,475 shrimp trawls with a combined measurement of 48,000 yards across the lead line.

Oysters: The 1963 oyster harvest in Texas yielded 2.6 million pounds of oyster meats valued at \$914,000 ex-vessel. That was more than double the 1962 landings and value, and established a new record for the State. The Galveston Bay system produced 81 percent of the 1963 oyster harvest, San Antonio Bay 12 percent, Lavaca Bay 4 percent, and 5 other bays accounted for the remainder. A total of 241 oyster-dredge craft and several tong crews shared in the record commercial oyster harvest. In addition, sport fishermen took



Fig. 3 - Oyster dredge at the dock, Fulton, Tex.

substantial quantities of oysters for home use. In 1963, most of the oyster meats were very good in quality. The yield of oyster meats per Texas bushel (92-96 pounds) of shell stock was down slightly from 1962 in both the spring and fall harvest because catches were not culled as carefully as in previous years.

Blue Crab: Texas landings of blue crab in 1963 were 3 million pounds with an ex-vessel value of \$200,000, a decline from the 4.5 million pounds valued at \$290,000 landed during 1962. Four crab-processing plants operated in Texas during 1963 and were supplied by 70 craft fishing a total of 9,668 crab pots.

Edible Finfish: Landings of edible finfish in Texas during 1963 amounted to 6.6 million pounds valued at \$1.3 million ex-vessel. Red snapper landings of 2.2 million pounds valued at \$590,000 accounted for 33 percent of the quantity and 45 percent of the ex-vessel value of the 1963 edible finfish landings in Texas. The red snapper landings were at the highest level since 1908 when 2.3 million pounds were landed. The red snapper catch contained many small fish in 1963. The catch of red snapper taken on many fishing trips consisted mostly of fish weighing less than 3 pounds. A total of 119 full- and part-time craft worked in the 1963 red snapper fishery. Four new vessels joined the snapper fleet in 1963.

Landings of almost all other edible finfish species of major commercial importance remained at the 1962 level. Spotted sea trout

Texas Fisheries Landings, 1962-1963

Species	1963		1962	
	Quantity Pounds	Value Dollars	Quantity Pounds	Value Dollars
Fish:				
Menhaden	83,735,900	1,034,170	103,874,000	1,137,394
Snapper, red.	2,168,700	590,440	1,742,300	444,308
Sea trout, spotted	1,190,200	301,601	989,100	248,583
Drum:				
Black.	1,362,700	106,935	1,373,200	105,125
Red (redfish)	685,600	165,878	699,400	171,063
Other fish	1,332,200	158,702	1,570,800	146,905
Total Fish	90,475,300	2,357,726	110,248,800	2,253,378
Shellfish:				
Crabs, blue	2,982,200	199,968	4,478,400	290,032
Oysters.	2,617,900	913,835	1,210,900	473,117
Shrimp (Heads-on): 1/				
Brown and Pink	55,811,100	21,752,846	44,250,700	22,156,446
White	13,719,500	4,805,748	10,813,600	4,893,721
Other	700,800	32,899	1,078,300	98,823
Squid	37,400	3,884	27,700	2,770
Total Shellfish	75,868,900	27,709,180	61,859,600	27,914,909
Grand Total	166,344,200	30,066,906	172,108,400	30,168,287

1/ Does not include bait shrimp sold to sport fishermen. Over 1 million pounds of bait shrimp valued at \$1.3 million was produced in the Galveston Bay area. Bay systems from Matagorda to Port Isabel also yielded substantial quantities of bait shrimp.

Note: Oysters are reported in pounds of meats (8.75 pounds per gallon). All other species are shown in round weight. The weight of heads-on shrimp was determined by multiplying heads-off weight by the following factors: brown, 1.61; pink 1.60; white 1.54; royal red, 1.80; and sea bobs, 1.53.

landings increased slightly, while the catch of redfish and black drum was practically unchanged.

General: About 40 new vessels (craft of 5 net tons and over) entered the Texas shrimp fishery in 1963, while about 10 vessels were lost at sea.

Two new types of winches were developed in the Aransas Pass area in 1963. One is a complete hydraulic system using three independent drums. It is practically free of wearing parts, easy to operate, and has good safety features. The second type winch is a modified gear-driven rig capable of holding enough cable to work waters in excess of 300 fathoms and was designed primarily for use by vessels fishing for royal-red shrimp.

Suction hoses for unloading industrial fish are being tried at Texas ports. The apparatus shows considerable promise, but the elaborate pick-up hose (some 10 inches in diameter) is heavy and somewhat difficult to handle.

There were no major changes in Texas port facilities in 1963. However, improvements for the Port Lavaca-Palacios area (comparatively minor ports prior to 1962) were made in 1963. New channels and a jetty system breaching the width of Matagorda Bay and extending just over 1 mile into the Gulf were partially completed. The expected completion date of the entire project will be late 1965. When completed, the project is expected to increase the landings of shrimp at Palacios and Port Lavaca as both ports are adjacent to the Pass Cavallo fishing grounds, one of the most productive areas in the northern Gulf of Mexico. (C. F. S. No. 3627, Texas Landings, 1963, U. S. Bureau of Commercial Fisheries.)



U. S. Fishing Vessels

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, OCTOBER 1-DECEMBER 31, 1964:

From the beginning of the program in 1956 through December 31, 1964, a total of 1,582 applications for \$41,665,972 were received by the U.S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. Of the total, 828 applications (\$18,656,590) had been approved, 520 (\$12,566,272) had been declined or found ineligible, 195 (\$7,701,992) had been withdrawn by the applicants before being processed, and 39 (\$725,270) were pending. Of the applications approved, 309 were approved for amounts less than applied for--the total reduction was \$2,015,848.

The following loans were approved from October 1, 1964, through December 31, 1964:

New England Area: George W. Durfee, Boothbay Harbor, Me., \$6,000; and Estrela Corporation, Gloucester, Mass., \$91,370.

California: Alfred P. Faraldo, Fort Bragg, \$8,283.

South Atlantic and Gulf Area: Jesse W. Callaway, Gulf Shores, Ala., \$7,666; and Edward F. Winchester, Brownsville, Tex., \$16,000.

Pacific Northwest Area: Peter S. Berg, Freeland, Wash., \$6,000; Peder L. Bredal & Leon Pedersen, Seattle, Wash., \$30,000; H. W. Myers, Seattle, Wash., \$7,359; North Pacific Enterprises, Inc., Seattle, Wash., \$80,000; and Kristen H. Vedo, Seattle, Wash., \$32,115.

Alaska: Karl E. C. Bradlee, Cordova, \$3,200; Maurice D. Ingman, Ketchikan, \$4,000; Sherman A. Vincent, Ketchikan, \$12,000; Arthur C. Nelson, Kodiak, \$48,000; Alfred Torsen, Ouzinkie, \$15,000; Richard I. Eliason, Sitka, \$5,000; and Thomas W. Maloney, Auke Bay, \$3,500.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the fourth quarter of 1964, 3 applications for \$131,662 were received. Since the program began (July 5, 1960), 64 applications were received for \$6,269,913. Of the total, 52 applications were approved for \$3,368,741 and 8 applications for \$2,272,654 were pending as of December 31, 1964. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 12 (\$1,314,500), approved 8 (\$775,365).

California: Received 2 (\$1,262,000), approved 1 (\$557,000).

South Atlantic and Gulf Area: Received 39 (\$1,777,389), approved 35 (\$1,455,305).

Pacific Northwest Area: Received 8 (\$1,861,250), approved 5 (\$526,296).

Alaska: Received 3 (\$54,774), approved 3 (\$54,774).



U.S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-December 31, 1964, amounted to 52,930,989 pounds (about 2,520,523 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was 3,482,649 pounds (about 165,841 standard cases) less than the 56,413,638 pounds (about 2,686,364 standard cases) imported during January 1-December 31, 1963.

Imports of canned tuna in brine in 1964 were substantially below the quota for the year. The quantity of tuna canned in brine which could have been imported into the United States during the calendar year 1964 at the 12½ percent rate of duty was 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota would have been dutiable at 25 percent ad valorem.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS, JANUARY-OCTOBER 1964:

Airborne fishery imports into the United States in October 1964 consisted mainly of shrimp from Venezuela and Panama. Shipments were about the same as in the previous month.

Airborne shrimp imports in October 1964 totaled 735,300 pounds, the bulk of which was fresh and frozen raw headless shrimp. About 98 percent of the airborne shrimp imports in October 1964 entered through the Customs District of Florida. The remainder entered through the Customs Districts of New York (N.Y.), Galveston (Tex.), New Orleans (La.), Los Angeles (Calif.), and Puerto Rico.

Spiny lobsters from British Honduras and Jamaica were the main shellfish item other than shrimp imported by air in October 1964.

Total airborne fishery imports in January-October 1964 were down 7.8 percent in quantity and 6.4 percent in value from those in the same period of 1963. The decline was due to smaller shipments of shrimp and spiny lobsters from Central and South American countries.

U. S. 1/Airborne Imports of Fishery Products, January-October 1964 with Comparative Data						
Product and Origin 2/	1964				1963	
	October		Jan.-Oct.		Jan.-Oct.	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:						
Mexico	6.8	0.7	320.5	64.7	245.2	66.4
Canada	-	-	14.8	4.8	-	-
Other countries	2.9	2.4	30.8	37.7	100.9	114.4
Total fish	9.7	3.1	366.1	107.2	346.1	180.8
Shrimp:						
Guatemala	-	-	-	-	141.6	74.0
El Salvador	-	-	159.1	96.8	258.0	172.7
Honduras	-	-	10.3	3.8	99.8	52.3
Nicaragua	8.2	4.7	87.8	50.3	477.2	159.1
Costa Rica	14.1	5.6	310.2	166.8	582.5	278.9
Panama	137.3	87.3	950.1	586.4	1,442.5	776.2
Venezuela	574.7	302.5	5,245.9	2,504.9	4,161.9	1,956.1
Ecuador	-	-	-	-	111.6	39.4
France	-	-	-	-	2.6	0.9
British Guiana	-	-	10.5	5.2	-	-
Mexico	-	-	2.1	1.4	13.2	6.9
Other countries	1.0	1.7	13.1	6.9	-	-
Total shrimp	735.3	401.8	6,789.1	3,422.5	7,290.9	3,516.5
Shellfish other than shrimp:						
Canada	-	-	312.9	173.4	213.3	109.2
Mexico	-	-	14.4	9.9	97.6	57.6
British Honduras	46.4	38.4	253.7	203.9	309.9	253.7
Honduras	7.4	3.9	80.3	82.6	17.0	7.0
Nicaragua	-	-	50.5	40.0	164.5	100.0
Costa Rica	0.5	0.5	19.1	14.7	73.8	60.1
Jamaica	10.4	13.6	63.3	63.2	65.7	49.5
Other countries	4.0	1.4	58.5	25.8	102.7	90.9
Total	68.7	57.8	852.7	613.5	1,044.5	728.0
Grand total	813.7	462.7	8,007.9	4,143.2	8,681.5	4,425.3

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/F.o.b. point of shipment. Does not include U.S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: United States Airborne General Imports of Merchandise, FT 380, October 1964, U.S. Bureau of the Census.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

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PROCESSED EDIBLE FISHERY PRODUCTS, NOVEMBER 1964:

United States imports of processed edible fishery products in November 1964 were down 10 percent in quantity and 1 percent in value from those in the previous month due mainly to lower imports of frozen groundfish fillets and blocks from Canada. The decline was partly offset by higher imports of sea catfish fillets, halibut fillets, canned albacore tuna, canned sardines in oil, and canned crab meat.

Compared with the same month in 1963, imports in November 1964 were down 4 percent in quantity, but up 12 percent in value.

In November 1964, imports were down for cod fillets, ocean perch fillets, canned tuna other than albacore, and canned oysters. But imports in November 1964 were up for flounder fillets, swordfish fillets, sea catfish fillets, yellow pike fillets, canned albacore tuna, canned sardines in oil and not in oil, and canned crab meat.

In January-November 1964, imports were up 1 percent in quantity and 6 percent in value from those in January-November 1963. During January-November 1964, there were larger imports of groundfish blocks (increase mainly from Canada and Iceland), flounder fillets, yellow pike fillets, and sea catfish fillets. Imports were also up for canned albacore tuna and canned sardines not in oil. But there was a decline in imports of most other canned fish import items (tuna other than albacore, crab meat, oysters, salmon, and sardines in oil).

U.S. Imports and Exports of Processed Edible Fishery Products, November 1964 with Comparisons

Item	Quantity		Value	
	Nov. 1964/1963		Nov. 1964/1963	
	1964/1963	1964/1963	1964/1963	1964/1963
	.. (Millions of Lbs.) ..		.. (Millions of \$) ..	
Fish & Shellfish:				
Imports 1/	49.8	51.8	497.7	493.4
Exports 2/	6.7	3.7	45.0	30.2
	16.6	14.8	151.8	143.7
	3.3	1.8	23.6	14.5

1/Includes only those fishery products classified by the U.S. Bureau of Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i.e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

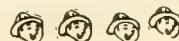
2/Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in November 1964 were up 46 percent in quantity and 6 percent in value from the previous month due mainly to heavy shipments of canned salmon and canned squid. In November 1964, shipments of canned salmon totaled 3.6 million pounds (about half of which went to the United Kingdom); shipments of canned squid totaled 1.1 million pounds (most of which went to Greece).

Compared with the same month of 1963, the exports in November 1964 were up 81 percent in quantity and 83 percent in value. The increase was due mainly to larger shipments of canned salmon.

Processed fish and shellfish exports in the first 11 months of 1964 were up 49 percent in quantity and 63 percent in value from those in the same period of 1963. In January-November 1964 there were much larger shipments of canned mackerel and canned salmon. Exports of canned shrimp and canned sardines in oil were also higher, but exports of canned sardines not in oil and canned squid were down.

Note: See *Commercial Fisheries Review*, Feb. 1965 p. 44.



Vessels

CERTAIN DRY CHEMICAL FIRE EXTINGUISHERS REQUIRE PRESSURE GAUGES:

The U. S. Coast Guard has ruled that all fire extinguishers of the dry-chemical, stored-pressure type manufactured after June 1, 1965, must be equipped with pressure gauges if the extinguishers are to be carried on board motorboats or other vessels as required equipment.

That ruling does not affect extinguishers now carried on board and not fitted with pressure gauges as long as the extinguishers are maintained in good and serviceable condition.

Dry-chemical extinguishers have a smothering action that is effective on burning liquids such as gasoline, oil, and grease. Dry-chemical extinguishers are also effective for fighting live electrical fires in motors, switches, and navigating and fish-finding equipment.

Vessel owners are urged to maintain their fire protection on board and have their fire extinguishers refilled and retagged at least once a year.



Virginia

MARINE SCIENCE SUMMER TRAINING PROGRAM FOR HIGH SCHOOL STUDENTS:

The National Science Foundation has granted \$8,245 to the Virginia Institute of Marine Science to conduct a marine science training program in Norfolk, Va., during the summer of 1965. The program is for high school students.

The Virginia Institute has presented advanced science courses in Norfolk to outstanding students for three summers. The purpose of the program is to challenge exceptional secondary school students to higher achievement, and to make it possible for Norfolk schools to use their marine environment as an aid in developing a strong science curriculum.

Fifteen students will be admitted to the program, 10 of whom will be selected from the private and public schools of Norfolk. Five students may be selected from other schools in the continental United States. Stu-

dents accepted into the program must have studied biology and completed the 10th grade.

Three science teachers will also be selected for the program so they will become familiar with marine ecology. Participating teachers will form a nucleus around which improved science courses will be built. (Virginia Institute of Marine Science, Gloucester Point, January 8, 1965.)



Washington

UNEMPLOYMENT INSURANCE COSTS IN THE FISHING INDUSTRY:

An analysis of unemployment insurance in Washington State shows that fishing industry benefits have exceeded tax income. From 1939 through 1963, benefits to the fishing industry were more than 3 times greater than tax income. To have matched unemployment insurance taxes with benefits to the fishing industry in Washington State, the tax rate in the fishing industry would have had to be about 8.5 percent of taxable wages rather than the statutory 2.7 percent.

In terms of high relative benefit costs, however, the fishing industry in Washington State was surpassed in 1964 by the heavy construction industry and by the "miscellaneous manufacturing" group. (Washington State Employment Security Department.)

* * * * *

ROCK SLIDE INTERFERES WITH SALMON MIGRATION ON COWLITZ RIVER:

On December 14, 1964, a rock slide blocked fish ladders at Mayfield Dam on the Cowlitz River in Washington State. With the fish ladders knocked out, migrating silver salmon and steelhead trout were temporarily unable to reach upstream spawning grounds. Emergency action opened two minor fishway entrances at Mayfield Dam by December 31, 1964. It was hoped that some salmon and steelhead were getting past the dam through those entrances.

Salmon and steelhead migrants arriving in the Mayfield Dam area after the slide occurred were collected below the dam and trucked around the project to continue their journey upstream.

The number of salmon and steelhead which were delayed by the slide and lost their spawning potential is not known. An additional 3,000 to 5,000 coho salmon and upwards of 10,000 steelhead are expected to reach Mayfield Dam during the first part of 1965.

Permanent correction of the fish facilities at Mayfield Dam cannot be started until water conditions permit a more thorough evaluation of the damage. The work may have to be delayed until early summer 1965.

The director of the Washington State Department of Fisheries said the situation is similar to that at Mayfield in the spring of 1962 when a slide trapped more than 1,500 steelhead between the powerhouse and the arch dam. The magnitude of the recent slide and subsequent blockage of the fishway, however, is much greater than that experienced in 1962.

The slide in December 1964 at Mayfield destroyed portions of both the upstream and downstream flume systems, which are a part of the permanent fish collection and trans-

portation system. Rock deposited below the spillway from the slide was carried over the fish barrier dam by the high spillway flows. That dumped a large quantity of rock in the river below the barrier dam in front of the powerhouse. The rock material made the adult-collection and fish-ladder facilities completely inoperable. In addition, turbulence created in front of the adult fish entrances stopped all upstream migration of salmon and steelhead. (Washington State Department of Fisheries, January 7, 1965.)



Wholesale Prices

EDIBLE FISH AND SHELLFISH, JANUARY 1965:

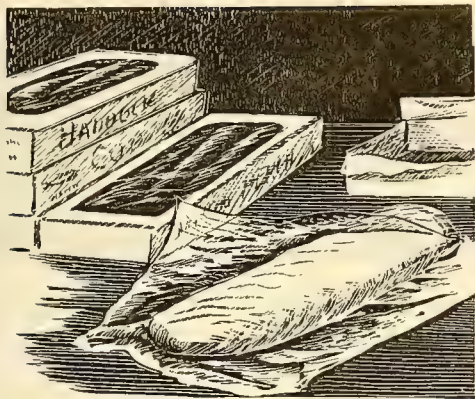
Prices for fresh and frozen fishery products rose 2.4 percent from December to January. The January 1965 wholesale price index for edible fish and shellfish (fresh, frozen, canned) at 112.1 percent of the 1957-59 average was 2.1 percent higher than in the same month of 1964.

An increase in the drawn, dressed, or whole finfish subgroup index of 9.5 percent from December to January resulted from (1) a sharp increase in prices at Boston for extra-large haddock (up 34 percent); (2) substantially higher

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, January 1965 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1957-59=100)			
			Jan. 1965	Dec. 1964	Jan. 1965	Dec. 1964	Nov. 1964	Jan. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					112.1	109.5	108.9	109.8
<u>Fresh & Frozen Fishery Products:</u>					118.3	113.8	113.0	113.0
<u>Drawn, Dressed, or Whole Finfish:</u>					121.8	111.2	111.7	116.5
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.17	.13	133.3	99.5	107.8	141.0
Halibut, West, 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.40	118.3	118.3	112.4	96.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.85	.83	119.1	115.6	115.6	118.4
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.61	.51	90.3	76.1	74.6	69.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.75	.70	122.8	114.6	106.4	80.3
<u>Processed, Fresh (Fish & Shellfish):</u>					116.0	111.9	111.1	115.4
Fillet, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.56	.45	134.8	109.3	106.9	142.0
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.94	.90	109.6	105.5	102.5	100.8
Oysters, shucked, standards	Norfolk	gal.	7.13	7.13	120.1	120.1	122.2	128.6
<u>Processed, Frozen (Fish & Shellfish):</u>					111.8	112.8	110.8	102.8
Fillet: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.37	.37	92.5	92.5	88.7	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.40	.40	115.8	115.8	112.9	114.3
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.30	106.9	105.2	103.4	117.5
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.95	.96	112.1	113.8	112.7	95.5
<u>Canned Fishery Products:</u>					101.8	102.2	102.2	104.7
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.00	21.25	91.5	92.6	92.6	102.4
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	103.3
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	97.5
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	114.9

^{1/}Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



prices for Great Lakes fresh-water fish--Lake Superior fresh whitefish prices at Chicago were up 18.7 percent and round fresh yellow pike prices at New York City increased 7.2 percent; and (3) a 3-percent rise in frozen dressed king salmon prices. Prices for frozen dressed western halibut were steady during January and remained unchanged from the previous month. As compared with the same month a year earlier, prices this January were higher for all products in the subgroup (except fresh ex-vessel haddock--down 5.5 percent) and the index was higher by 4.5 percent. January 1965 prices for frozen halibut were 23.1 percent higher than in January a year earlier because of low stocks in cold-storage, and prices for Great Lakes fish were sharply higher due to very light market supplies.

Higher January 1965 prices for most processed fresh fish and shellfish products were responsible for a 3.7-percent increase from the previous month in that subgroup index. Fresh small haddock fillets at Boston were much higher-priced (up 23.3 percent) this January than in December 1964, but they were 5.1 percent lower than the very high prices of January 1964. A gradually stronger market at New York City for fresh South Atlantic shrimp (wholesale price up 4 cents a pound) this January caused prices to rise 8.7 percent above January a year earlier. The January 1965 subgroup index was up only slightly from the same month in 1964 because considerably higher shrimp prices were offset by price decreases for other items in the subgroup.

From December 1964 to January 1965, prices for frozen ocean perch fillets at Boston rose slightly (up 1.6 percent) while at Chicago frozen shrimp prices declined in about the same proportion. Those opposite trends resulted in an 0.9-percent drop from the previous month in the January 1965 processed frozen fish and shellfish subgroup index. January prices for other items in the subgroup were unchanged from the preceding month. The January 1965 subgroup index at 11.8 percent of the 1957-59 average was 8.8 percent higher than in January 1964 principally because of considerably higher shrimp prices and a small increase in prices for frozen haddock fillets.

Slightly lower prices for canned pink salmon (down 1.2 percent) in January 1965 brought the subgroup index for canned fishery products down 0.4 percent from the previous month. Prices for all other canned fishery products in the subgroup--tuna, jack mackerel, Maine sardines--remained unchanged from November 1964 through January 1965. Canners' stocks of pink salmon (16-oz. No. 1 tall) on hand January 1, 1965, were about 1.4 million cases as compared with nearly 1.6 million cases on hand December 1, 1964. As compared with January 1964, the subgroup index this January was 2.8 percent lower--prices this January for canned salmon and tuna were lower, but those for Maine sardines and California jack mackerel were much higher than in the same month a year earlier because stocks were light.



OUR DROWNED ATLANTIC COAST SHORELINE

At one time, not too long ago, the shoreline was well out to sea, and one present offshore fishing bank, Georges Bank, was an island. These events generally have been acknowledged by scientists for some time now, but recently biologists from the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass., and the Woods Hole Oceanographic Institution have added significantly to our knowledge of older shorelines. They delineated two ancient oyster reefs at depths of 19 and 30 fathoms (115 and 180 feet), extending from Cape Cod to Cape Hatteras, respectively, dating approximately 8,000 and 11,000 years ago. More recently the Oceanographic Institution biologist has announced the discovery of peat from Georges Bank, containing the remains of salt marsh grasses and spruce. This is the first solid evidence that Georges Bank was a forested island during the glacial period.



International

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ANNUAL MEETING:

The annual meeting of the International Pacific Halibut Commission was held at Vancouver, B.C., starting January 19, 1965. The opening session was with fishermen, vessel owners, dealers, and other interested parties for the presentation and discussion of the findings and regulatory proposals of the Commission, and for preliminary discussion of any new regulatory suggestions.

On January 21 a joint meeting was held with the Conference Board of fishermen's and vessel owners' representatives and with dealers' representatives, and other invited persons.

The International Pacific Halibut Commission is responsible for the regulation of the halibut fishery of the Northern Pacific Ocean and Bering Sea.

The Commission is composed of the following members for the United States: Harold E. Crowther, Chairman; and Haakon M. Selvar. The third United States Commissioner, to succeed William A. Bates who died on October 29, 1964, has not yet been appointed by the President. Members for Canada are: Dr. William M. Sprules, Vice Chairman; Martin K. Eriksen; and Frank W. Millerd.

INTERNATIONAL NORTH PACIFIC SALMON FISHERIES COMMISSION

FORECAST OF 1965 SOCKEYE AND PINK SALMON RUN TO PUGET SOUND AND FRASER RIVER:

The International North Pacific Salmon Fisheries Commission held its annual meeting in Bellingham, Wash., December 11, 1964. The Commission regulates the catch of pink and sockeye salmon in certain waters of Washington State and British Columbia. The catch in those waters (known as Convention waters) is adjusted to provide adequate escapement of pink and sockeye salmon. Fishing is also regulated to divide the allow-

able catch equally between United States and Canadian fishermen.

The staff of the Commission has developed rough estimates--representing "not a prediction but a guess"--of the 1965 run in Convention waters as follows:

Sockeye Salmon: The 1965 sockeye run to the Fraser River may be substantially lower than that in the brood year of 1961 when there was a disappointing run of only 4,125,000 sockeye in Convention Waters. That sockeye forecast is based on the heavy mortality which occurred on the spawning grounds in the brood year of 1961. The Commission has planned regulations on the basis of a total run in 1965 of 3 million sockeye allowing for an escapement of 1 million. However, to gain an accurate insight into the size of the 1965 sockeye run the Commission will have to wait for the appearance of the Early Stuart run in late June and early July 1965. A good run will raise hopes for the balance of the Fraser run, a poor one will be disappointing.

The proposed regulations for the sockeye fishery in Convention waters will be adjusted up or down during the season, depending on the weekly catch, to provide a total escapement of about 1 million sockeye regardless of the size of the run.

Pink Salmon: The Commission is projecting a 1966 pink salmon run in Convention waters of 10 million fish compared with 16 million in 1963. That includes 6.5 million Fraser River fish--up from 4.5 million in 1963. The Puget Sound run of pink salmon in 1965 is expected to be down considerably from the spectacular run of 10.5 million fish in 1963. (*Facts on Fish*, Fisheries Association of B.C., December 21, 1964.)

FISH MEAL

WORLD PRODUCTION, OCTOBER 1964:

World fish meal production in October 1964 was up 40 percent from the previous month due mainly to a seasonal increase in Peruvian output.

International (Contd.):

World Fish Meal Production by Countries, January-October 1963-1964				
Country	Oct.		Jan.-Oct.	
	1964	1963	1964	1963
	. . . . . (Metric Tons).			
Canada	4,927	12,553	44,623	64,583
Denmark	13,074	6,727	95,645	87,170
France	1,100	1,100	11,000	11,000
German Fed. Republic	6,369	5,585	63,545	63,792
Netherlands	900	900	6,700	5,600
Spain	1/	1,900	1/	18,812
Sweden	673	639	5,973	5,174
United Kingdom	5,584	5,516	63,807	63,757
United States	8,373	16,572	175,823	195,379
Angola	5,402	3,620	47,475	21,394
Iceland	13,064	930	115,309	78,267
Norway	15,815	7,822	162,630	109,907
Peru	130,492	76,764	1,189,562	903,437
So. Afr. (incl. S.-W. Afr.)	15,855	14,749	2/ 250,928	233,072
Belgium	375	375	3,750	3,750
Chile	10,743	858	124,979	75,877
Morocco	1/	-	3/ 17,150	1/
Total	232,746	156,610	2,378,899	1,940,971

1/Data not available.

2/Revised.

3/Data available only for Jan.-Sept. 1964.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

World fish meal production in the first 10 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 50 percent of world output during January-October 1964. Higher production during January-October 1964 was also reported in Norway, South Africa, Chile, Iceland, Angola, and Denmark. The increase was partly offset by lower production in Canada and the United States.

Most of the principal countries producing fish meal submit data to the Association monthly (see table).

EUROPEAN FREE TRADE ASSOCIATION

INDUSTRIAL TARIFFS REDUCED
ANOTHER 10 PERCENT:

On December 31, 1964, a further cut of 10 percent was made in the level of tariffs on industrial goods traded among the seven Member Countries of the European Free Trade Association (EFTA)--Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom. The 10 percent reduction also applies to imports from Finland, which is associated with EFTA. (The temporary 15 percent surcharge on imports recently imposed by the United Kingdom for balance of payments reasons is not affected by the new EFTA tariff cut.)



The latest EFTA tariff cut brings the general level of EFTA tariffs on industrial goods

down to 30 percent of the level in force on January 1, 1960. Finnish tariffs on most EFTA industrial goods will be reduced to 30 percent of their basic level on March 1, 1965. Fishery and agricultural products are not included under industrial goods.

A further reduction of 10 percent in EFTA tariffs will be made at the end of 1965. The remaining 20 percent will be eliminated on December 31, 1966, for the seven EFTA Member Countries; in the case of Finland, the remaining 20 percent will be eliminated in two stages--10 percent at the end of 1966 and 10 percent at the end of 1967. (European Free Trade Association, December 31, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 35.

TERRITORIAL WATERS AND FISHING LIMITS

VIOLATIONS CHARGED BY SEVERAL
EUROPEAN COUNTRIES:

Danish and West German Salmon Cutters Fined for Entering Polish Waters: Eight Danish and two West German salmon cutters were in sheltered waters off the Polish coast on November 19, 1964, when a Polish patrol vessel appeared and signaled they should proceed to Gdynia. On arriving at the Polish port, the salmon cutters were accused of fishing within 1 nautical mile of the Polish coast, according to newspaper reports. In 2 days the Danish vessels were released after paying a fine and costs amounting to 180 kroner (US\$26.10). The West German vessels were reported to have paid larger fines. The Danish cutters claimed they had taken shelter in the lee of a storm with their engines stopped and their gear stowed under the deck when they were forced to head for Gdynia.

Denmark Charges Foreign Vessels with Fishing Limit Violations: Two Polish cutters were apprehended by Danish authorities on September 5, 1964, and charged with fishing within Danish fishing limits off Christiansø on the island of Bornholm. According to newspaper reports, the Polish cutters were fishing with floating trawls for herring and had a catch of 6,600 pounds when picked up. A few days later the cases were heard in court and the Polish vessel captains were fined.

In late 1964, the Danish Fisheries Ministry sent an inspection vessel to Aalbaek Bay, a fishing area near Skagen, one of Denmark's most important fishing ports, to look into the complaints of local fishermen about the activities of foreign fishing fleets, especially Soviet, Polish, and East German vessels. Dan-

International (Contd.):

ish fishermen claim that the foreign vessels anchor within Danish fishing limits where they transfer catches, discard wornout gear and other offal, and interfere with the fishing activities of about 20 Danish seiners which operate in the bay.

The Skagen Fisheries Association complained about the situation to the Soviet Government and received in reply a letter from the Soviet Embassy stating that arrangements had been made which would prevent the future discharge of offal from Soviet vessels not only in Aalbask Bay but in all Danish waters. At the same time, the letter pointed out that the Soviet Union could not be responsible for violations of vessels not under the Soviet flag.

Representatives of Polish fishermen are expected to visit Denmark to discuss fishery problems with Danish fishermen.

Danish Fishing Vessels Refused Shelter in East German Waters: In two instances in late 1964 Danish fishing vessels were barred from seeking shelter in East German territorial waters. A vessel from Stubbekøbing seeking shelter near Darsser Ort in November 1964 was boarded by an East German patrol vessel. After the papers of the Danish vessel were examined it was ordered to leave East German territorial waters.

Another Danish vessel from Stubbekøbing seeking shelter along the East German coast was also boarded by an East German patrol. The Danish skipper was taken to Warnemünde for a hearing and accused of illegal fishing. Later he was released and ordered outside the East German 3-mile limit.

East German Trawler Warned in Greenland Waters: During an inspection trip in the southern district of Greenland in October 1964, a Danish inspection vessel came upon an East German trawler anchored in Arsuik Fjord, according to a Danish newspaper. A Danish fishery officer went on board the East German vessel which turned out to be a modern stern trawler equipped to fish in North Atlantic waters and also serve as a marine research vessel. The East German vessel captain was warned that in the future he must seek permission to enter and remain in Greenland waters. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, December 2 and 22, 1964.)

EUROPE

FISHERY LANDINGS AT RECORD HIGH IN 1963:

The combined fishery landings of European nations (not including U.S.S.R.) in 1963 were at a record high of 8.84 million metric tons accounting for 19 percent of the world catch. Only Asia, with a total catch of 17.8 million tons (39 percent of the world total) caught more fish in 1963 than the nations of continental Europe, the Food and Agriculture Organization (FAO) announced December 22, 1964.



Fig. 1 - A typical 52-gross-ton Danish fishing vessel operating out of Skagen.

Other fishery catches by continent in 1963 were: South America, 8.49 million tons or 18 percent of the world total, North America (including Greenland, Central America, the Caribbean Islands, Canada, Mexico, and the United States), 4.31 million tons (9 percent); the U.S.S.R., 4.0 million tons (9 percent); Africa, 2.81 million tons (6 percent),

The largest European fishery catch was Norway's with 1,387,800 tons, a slight increase over the 1,331,700 tons caught in 1962.



Fig. 2 - Britain's first conventional distant-water freezer-trawler, Ross Fighter.

International (Contd.):

Norway ranked sixth in world fishery landings-- behind Peru, Japan, Mainland China, the U.S.S.R., and the United States. Norway's best fishing year was 1956 when 2,187,300 tons was caught.

Spain ranked second among European nations with a 1963 fishery catch of 1,097,900 tons, and was in ninth place in world fishery landings. In 1962, Spain's fishery landings were 1,075,400 tons.

In 1963 Denmark and the Faroe Islands caught 985,000 tons, an increase of 56,600 tons over the 1962 catch of 928,400 tons. They were in 11th place in the 1963 world order.

of fish in 1963--a total of 539,800 tons compared with 525,600 tons in 1962.

Other European nations catching 100,000 tons or more were: Netherlands 361,000 tons; Sweden, 339,800; Italy, 231,600; Poland, 226,700; and East Germany, 184,800. (Food and Agriculture Organization, Rome, December 22, 1964.)

NORTH AMERICA

FISHERY LANDINGS IN 1963:

Fishery landings in North America (includes Central America, Greenland, the Caribbean Islands, Canada, Mexico, and the United States) totaled 4,310,000 metric tons in 1963 as compared with 4,490,000 tons in 1962,



Fig. 1 - Purse seiners at a dock in San Pedro, Calif. (U.S.A.)

The United Kingdom fishery catch in 1963 was 951,200 tons as compared with 944,300 tons in 1962, and below the record 1948 catch of 1,206,100 tons. The United Kingdom ranked 12th in the 1963 world fishery catch.

Iceland's 1963 catch of 784,500 tons was below the 832,600 ton catch in 1962, and ranked 14th in the world.

France caught 742,300 tons in 1963, slight drop from the 744,300-ton catch in 1962. France's best fishery catch of 750,900 tons was in 1961. France ranked in 16th place in the 1963 world fishery landings.

The Federal Republic of Germany 1963 fishery catch was 646,900 tons. This was above the 1962 catch of 632,700 tons, but more than 100,000 tons below her best catch of 814,800 tons in 1955. The Federal Republic ranked 17th in the world.

Portugal was the only other European nation to catch more than one-half million tons

the Food and Agriculture Organization (FAO) announced December 22, 1964.

In 1963 the North American fishery catch accounted for about 9 percent of the total world catch of 46.4 million tons. It was the first time the North American catch dropped below 10 percent of the world catch; in 1948 it was 19 percent.

The United States fishery catch in 1963 was 2,711,900 tons, a drop of 260,900 tons from the 2,972,800 tons caught in 1962. The highest annual catch for the United States was in 1956 with 2,989,400 tons. Since then it has tended to average from 2.7 million to 2.9 million tons.

For several years the United States has ranked fifth in world fishery landings--behind Peru, Japan, Mainland China, and the Soviet Union.

Canada's 1963 catch was 1,191,300 tons, the highest ever recorded; in 1962 it was 1,124,800 tons.

International (Contd.):



Fig. 2 - Irish moss, a multi-use seaweed abundant on parts of the Canadian Atlantic Coast. Impurities are being removed from Irish moss drying in the sun near Miminegash, N.B., Canada.

Mexico's 1963 catch was 244,300 tons, also a record catch for that country. In 1962 it was 218,600 tons, and the previous high was in 1961 with 225,400 tons.



Fig. 3 - Fresh-water fish farm at Chapingo, near Mexico City, Mexico. Workers catching fish in one of the ponds by setting a net across it.

Greenland's catch was 33,300 tons, a drop of 10,000 tons from the 1962 total of 43,300 tons, and the lowest since 1958.

Cuba's 1963 catch was a record 35,600 tons, slightly above the 35,000 tons caught in 1962. Cuba's fishery catch has increased steadily over the past few years.

The 1963 fishery catch of all other North American countries was less than 20,000 tons for each country. (Food and Agriculture Organization, Rome, December 22, 1964.)

FOOD AND AGRICULTURE ORGANIZATION

HIGHLIGHTS OF 11TH SESSION OF
INDO-PACIFIC FISHERIES COUNCIL:

The 11th Session of the Indo-Pacific Fisheries Council (IPFC) of the Food and Agriculture Organization (FAO) was held at Kuala Lumpur, Malaysia, October 16-31, 1964. Highlights of topics discussed follow:

Cooperative Study of the Kuroshio Current: The Council noted the proposed Cooperative Study of the Kuroshio (CSK), laid down in document UNESCO/IOC/INF-47, and the resolution (Resolution III-5) on the CSK approved at the Third Session of the Intergovernmental Oceanographic Commission (IOC). The importance of an understanding of the environment in the development of fishery resources to their maximum sustainable yield is recognized. The CSK has potential to contribute such understanding for a large area of the western Pacific Ocean.

The Council noted that the proposed fishery aspects of the CSK are stated in rather general terms, without reference to specific processes, fisheries, or areas as the objects of study. Owing to the existence of a considerable store of knowledge of the resources of the Kuroshio area and to the limitation of, for example, the amount of ship time available, it was considered that a set of specific problems should be selected for study and effort concentrated on the sea. The Council believed, however, that the specific fishery problems to be studied as part of the CSK must be defined by those fishery scientists and agencies who will actually bear the responsibility for making the studies. The Council recognized that the physical, chemical, and biological oceanographic observations will provide a general framework within which the fishery observations may be considered.

Pollution: The views and policy expressed by the Council on pollution were:

International (Contd.):

1. "Viewing with concern the continued increase in the pollution of natural waters, both fresh and coastal, through industrial development, urbanization, and modern agricultural practice.

2. "Emphasizing that the use of pesticides harmful to aquatic life, particularly by broadcasting, was rendering large areas of fish-producing waters no longer fully productive.

3. "Considering that the long term effects of the continued use of such pesticides could be potentially of considerable danger not only to the living aquatic resources but also to their food organisms and to man himself."

The Council resolved to: (a) "Emphasize to Member Governments the urgent and immediate need to review their policies in this regard.

(b) "Urge on Member Governments the desirability of exploring more fully the possibility of developing and adopting suitable (including biological) control measures not harmful to aquatic life against agricultural pests.

(c) "Request the Director-General of FAO to render all possible assistance to Member Governments in order to diminish by all practical measures the current dangers.

(d) "Request the Director-General of FAO to make available to Member Governments the documentation on pollution control in Europe and North America and urge on them the desirability of adopting the code presented in these documents and of forming suitable bodies to implement that code."

Recommendation on the Indian Ocean: The Council recognized the growing need for animal protein in the human dietary requirements of the countries surrounding the Indian Ocean and was aware of the ability of the Indian Ocean fishery resources, if rationally developed, to contribute substantially to the filling of those needs on a sustainable basis.

Further, the Council realized the need, by developing fishing industries, and the governments in those countries to be able to take into account the seasonal and cyclical variability in fish availability and abundance arising from temporal changes in the environment as well

as from increased fishing pressure in planning the rational development of those fisheries, since local conditions of fish abundance and availability may be strongly affected by climatic and oceanographic conditions arising in the far distance and not detectable locally. Recognizing the necessity for a regional ocean-wide, as well as national approach to those problems into which the results of national fishery development programs can be fitted and can grow, the Council resolved to request FAO in consultation with appropriate other United Nations bodies, to examine the feasibility of designing and funding a program of fishery oceanography for the Indian Ocean which would provide a regional background of knowledge and understanding of the ocean for the use of national fishery development programs, which would make use of this sort of information arising from the International Indian Ocean Expedition and national fishery development work, and which would provide a long-range program incorporating both national and regional elements under which the rational development of the Indian Ocean Fisheries could proceed expeditiously.

South China Sea and Sunda Shelf: The Governments of Thailand and Vietnam proposed to conduct a cooperative research project in the South China Sea and the Sunda Shelf with particular emphasis on research that might lead to the development of the fishery resources of that area. The Council recalled that various studies had been made of the area, notably the Naga Expedition in the Gulf of Thailand and the South China Sea, and recognized that the results of this and other expeditions would provide much guidance in planning the project proposed by the Governments of Thailand and Vietnam.

Recognizing the contribution that the proposed project could make to development of fisheries in the region, the Council resolved to recommend the project to the attention of countries bordering the Sunda Shelf, especially Malaysia and the Philippines. The Council requested FAO and UNESCO to give all possible assistance to the project, and suggested that the working party appointed in connection with the compilation of data from tropical trawling operations by Malaysia fishermen might be able to assist in planning that project and interpreting its results.

FAO's Role in Fishery Development: The Council considered Resolution 8/63 of the 12th Session of the FAO Conference which requested

International (Contd.):

the Director-General and the FAO Council to improve the status of fisheries within FAO. The IPFC Council, represented by the Member Governments of Australia, Ceylon, France, India, Japan, Korea, Malaysia, Netherlands, Pakistan, Philippines, Thailand, United Kingdom, United States, and Vietnam, recommended that the Fisheries Division of FAO be elevated to the departmental level in the 1966/67 biennium. It proposed that the Director-General might present this recommendation to the upcoming 13th Session of the FAO Conference, to be held in the fall of 1965 in Rome, Italy. The Council indicated that this action was desirable in order that "FAO may be better organized to aid Member Countries speed the rational development of their Fisheries in the Indo-Pacific area as well as elsewhere."

Note: See Commercial Fisheries Review, December 1964 p. 73.

OCEANOGRAPHY

NORDIC CULTURAL COMMISSION MEETS:

At its meeting in Helsinki on November 16-18, 1964, the Nordic Cultural Commission (Nordiska Kulturkommissionen), among other things, recommended that the Nordic countries (a) augment their national efforts in physical oceanography, and (b) develop a joint program to promote research in physical oceanography. To initiate work on promoting research in physical oceanography, the Commission requested that 100,000 Norwegian Kroner (about US\$14,500) be made available for the Fiscal Year 1965/1966. It is understood that Norway will serve as the coordinating country.

The group of experts at the meeting have identified certain areas of collaboration which should have priority during the initial phase. They include: (1) a fellowship and stipended program to facilitate exchange of teachers, scientists and students; (2) arrangements for joint symposia, exchange of information, data, etc.; (3) joint expeditions on the high seas; (4) joint efforts in developing equipment (including oceanographic buoys); (5) the establishment of a Nordic Board of Physical Oceanography (Nordisk Kollegium for Fysisk Oceanografi) along the lines already existing for marine biology.

That Board is to be composed of one representative for each of the 5 countries. As progress is made to recruit talent and to develop a joint program, coordination of the ef-

forts in physical oceanography and marine biology will be considered.

At its November meeting the Nordic Cultural Commission approved the proposals of the group of experts and since considerable prior coordination had been achieved. It was believed that the individual governments will approve the proposals made.

Impressions derived from the meeting, which were also shared by influential persons in Denmark, Finland, Norway, and Sweden, were the recommendation adopted by the Nordic Cultural Commission need not be nearly as modest as the requested appropriation might indicate. Funds for oceanographic work are available in the regular budgets of the institutions concerned, and additional funds can be obtained from different Research Councils and other money-granting national organizations. The short-term gain of the program may be considerable and will come from a re-orientation of the national programs, a stimulation of influx of new talent to oceanography, and better recognition of the importance of oceanography by the governments and parliaments concerned. Such recognition may be further stimulated if it were made known that a joint and expanded effort in oceanography by the Nordic countries would be a valuable component of a general scheme for the North Atlantic and Arctic region. (United States Embassy, Stockholm, December 16, 1964.)

WHALING

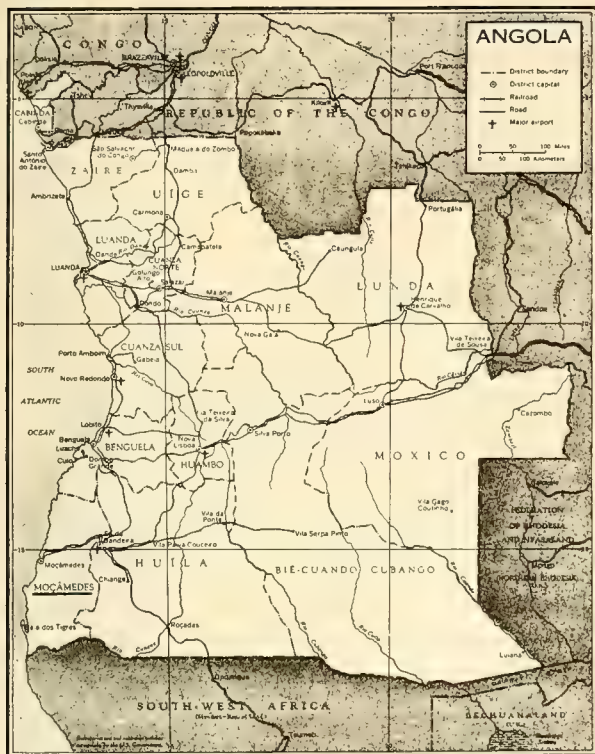
ANTARCTIC SEASON FOR 1964/65
OPENED DECEMBER 12, 1964:

The 1964/65 Antarctic whaling season opened on December 12, 1964, with a total of 15 expeditions from the U.S.S.R., Japan, and Norway participating. Norway has 4 factoryships and 36 catchers; Japan, 7 factoryships and an estimated 76 catchers; the U.S.S.R., 4 factoryships and an estimated 68 catchers. (United States Embassy, Oslo, December 22, 1964.)

**Angola**NEW FISH-PROCESSING INDUSTRY
PLANNED FOR SOUTHERN REGION:

The Angolan press reported in November 1964 that the Sociedade Portuguesa de Pescarias Restole (SARL) has requested authorization from the provincial government of An-

Angola (Contd.):



gola to install a new fish-processing industry in Mocamedes. Construction is to be in two phases--first, a refrigeration plant with a capacity of 2,500 tons, and second, a factory for making fish meal and for salting, drying, and canning fish. (United States Consulate, Luanda, December 3, 1964.)



Australia

FISHERY EXPORT TRENDS,
JULY-SEPTEMBER 1964:

A sharp jump in scallop and shrimp exports was the main feature of Australian fishery exports in July-September 1964. Exports of spiny lobster tails were down due to bad weather in Western Australia, the main producing State. However, spiny lobster tail shipments were expected to improve when the main fishing season began. The total value of Australian exports of fishery products in July-September 1964 was up 14 percent from that in the same period of 1963, according to preliminary data.

Australian scallop exports continued their rapid expansion and reached a record level of A£55,000 (\$122,100) in September 1964. Export values in September 1964 for the other leading Australian fishery products were: shrimp A£202,000 (\$448,440); spiny lobster tails A£124,000 (\$275,280); and whole spiny lobster A£18,000 (\$39,960).

Value of Australian Exports of Leading Fishery Items,
July-September 1963-1964

Product	July-September			
	1964		1963	
	A£1,000	US\$1,000	A£1,000	US\$1,000
Spiny lobster:				
Tails	392	870	681	1,512
Whole	147	326	124	275
Total spiny lobster	539	1,196	805	1,787
Shrimp	466	1,035	217	482
Scallops	142	315	-	-
Total of products shown	1,147	2,546	1,022	2,269

Note: Australian £1.00 equals US\$2.22.

Australian shrimp exports are steadily increasing as new grounds are developed off Queensland and Western Australia. Japan remains Australia's best customer for shrimp, accounting for 82 percent of the value of Australian shrimp exports in July-September 1964.

The United States remains the main market for spiny lobster tails and France takes most of the whole spiny lobsters.

Abalone is another shellfish resource which Australia is interested in developing. Australian exports of frozen abalone in fiscal year 1963/64 (ending June 1964) totaled 180,000 pounds and were valued at more than A£50,000 (\$111,000). Most of the frozen abalone went to Japan. (Australian Fisheries Newsletter, December 1964.)

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SPINY LOBSTERS BRING
RECORD PRICES:

In Australia during November 1964, the first 1964/65 season spiny lobster shipment from Tasmania sold for record prices on the Sydney Fish Market. The price for fresh boiled spiny lobsters was 7.5 shillings (83 U.S. cents) a pound.

Prices in Melbourne, Australia, also were strong with live spiny lobster flown from Tasmania selling for up to 6.75 shillings (75

Australia (Contd.):

U.S. cents) a pound, and fresh boiled spiny lobster for 7.5 shillings (83 U.S. cents) a pound.

The relatively high prices in Australia were said to reflect the high prices for spiny lobster tails in the United States. (Australian Fisheries Newsletter, December 1964.)

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NEW IMPORT DUTIES ON CANNED TUNA, CANNED SALMON, AND CANNED FISH CUTLETS:

Import duties on a wide range of canned fishery products were recommended by the Australian Tariff Board in a report presented in the Australian House of Representatives during October 1964. The Australian Government has adopted the main recommendations of the Tariff Board. Canned tuna, canned fish cutlets (barracouta, mackerel, etc.), and canned salmon are the most important items affected by the new tariffs. Following are the new Australian import duties levied on those items:

Canned tuna: 0.25d (0.23 U.S. cents) a pound for canned tuna from countries which are accorded "most favored nation" trading treatment. Such countries include Japan and Peru, the two main suppliers of canned tuna to Australia.

Canned fish cutlets: 9d. (8.3 U.S. cents) a pound.

Canned salmon: The new import duty on canned salmon applies only to imports with an f.o.b. value of less than 4.5s. (50 U.S. cents) a pound. When applicable, the duty on canned salmon is 1d (0.925 U.S. cents) for each 1.5d (1.388 U.S. cents) that the f.o.b. price falls below 4.5s. (50 U.S. cents) a pound.

The new import duties were imposed to give protection to the developing Australian canning industry. (Australian Fisheries Newsletter, December 1964.)

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SCALLOP SHELLS EXPORTED TO JAPAN:

A trial shipment of Tasmanian scallop shells has been made to Japan by a fishery firm in Sydney, Australia. Disposal of scallop shells has long been a problem to the Australia-

lian scallop industry, and the latest move to export them has aroused keen interest. It is believed that the shells shipped to Japan will be used to make shell jewelry and ornaments. A recent Australian overseas scallop market survey showed that there was a possible market in some countries, particularly Africa, for shells packed separately. (Australian Fisheries Newsletter, November 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 76.



Brazil

U. S. SURVEY TEAM REPORTS ON POTENTIAL OF COMMERCIAL FISHERY:

The commercial fish production in the reservoir system of Northeast Brazil can be more than doubled by eradicating the predator fish--the piranha. That opinion is shared by a team of five fishery specialists of the U. S. Bureau of Commercial Fisheries which conducted a three-month study in Brazil aimed at developing the protein resources of the economically-depressed northeast area of that country. The study was made in cooperation with the Agency for International Development (AID) and the Alliance for Progress.

A detailed report by the survey team states that Brazil's major fishery development plans for the Northeast are basically sound and will lead to significant increases in fishery production, marketing, and consumption. It adds that the major road-block to fisheries development in that area is caused by inadequate financial and technical development.

The report recommends that AID and the Alliance for Progress favorably consider loans for developing all phases of the fisheries in Northeast Brazil. It proposes that at least 3 specialists from the United States be sent to Brazil for 1 or 2 years to assist in fish population studies, technology and marketing, and modernization of reservoir fishing fleets. Another recommendation concerns a program of fellowships and training grants for several professional fishery workers in Brazil who are regarded as potential leaders in fisheries science.

A review of Brazil's fresh-water fishery resources based on the survey team's report follows:

Northeast Brazil is a geographic region comprised of the States of Maranhao, Piaui,

Brazil (Contd.):

Ceara, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe, and Bahia. In 1963, the population of the area was approximately 23.8 million people and represented one-third of the total population of Brazil.

In 1962, about 95,000 individuals in Northeast Brazil were considered professional fishermen (both fresh water and marine) and purchased licenses, compared to 257,000 fishermen for all of Brazil. Some of the professional fishermen in the northeastern area undoubtedly supplement their income by other part-time work. Other persons not classed as professional fishermen, fish for subsistence purposes and purchase no licenses. In 1962, the total catch of professional fishermen in Northeast Brazil was 283.4 million pounds (129,000 metric tons); the average catch per fisherman was estimated at slightly less than 3,000 pounds (1,360 kilograms). No separate estimates of the fresh-water and marine catch are available. In 1963, although the total catch of Northeast Brazil was not available, it was estimated that 110.2 million pounds (50,000 metric tons) of fresh-water fish were taken by professional fishermen. The most common types of gear used by professional fresh-water fishermen are gill nets and cast nets. By far the majority of fishing craft are pirogues and canoes, and are paddled by hand. A few fishing craft are equipped with sails.

No reliable estimate of the per capita fish consumption is available. Fish and other food production, however, does not satisfy the protein needs of the majority of people in Northeast Brazil. Agricultural production, for example, is hampered by recurrent droughts and floods, and the average income of individuals is low. Fish is highly acceptable as a food by nearly all people in Northeast Brazil. In the inland and coastal cities, the demand for fish exceeds the supply. Near the reservoirs, the supply exceeds the demand; distribution and preservation problems prevent the surplus from reaching the ready markets in the larger inland and coastal population centers. Of the 29 species of food fish taken in the reservoirs, the curimata (Prochilodus sp.) is the most important.

The principal fishery products produced and marketed in Northeast Brazil are fresh and salted fish. Reservoir fish is sold directly to consumers for immediate consumption

and to truck owners for further sale and distribution. The truck owners transport the fresh and salted fish to nearby villages and the larger more distant cities, and sell to retail markets or ambulatory fish peddlers. While in transit, the fresh fish are carried iced in large boxes; the salt fish in bags.

Markets, particularly in villages, generally lack icing and cold-storage facilities. The marketing problems are associated not only with the marketing of fishery products, but also with the marketing of other fresh and salted meat products.

The principal Federal agency concerned with reservoir fishing activity in Northeast Brazil is the National Agency for Works Against the Drought (DNOCS). This agency, headquartered in Fortaleza, Ceara, has primary responsibility for the area largely within the Northeast known as the Drought Polygon. The Drought Polygon represents approximately 70 percent of the total area of Northeast Brazil, and contains by far the major share of the fresh-water fisheries. Fishery information and data on areas outside the Drought Polygon are very limited.

DNOCS controls 117 large reservoirs with a capacity of 2 million cubic meters of water or more within the Drought Polygon. This is the majority of large reservoirs in the Drought Polygon, but there are others not controlled by DNOCS. In addition, there are at least 3,000 small reservoirs with an average water capacity of 750,000 cubic meters within the Drought Polygon. The smaller reservoirs, and some large reservoirs, are not under the control of DNOCS: their control rests with state and municipal governments, and with private individuals.

In relation to the reservoir fisheries of the Northeast, DNOCS operates programs for piranha control, fish culture, and other activities:

Piranha Control: Piranha (Pygocentrus sp.) is particularly sensitive to rotenone, more so than other more desirable species, and succumbs in the presence of relatively small amounts (2-3 parts per million). After rotenone treatment of the Araras Reservoir, Ceara, in 1957-58, Dr. Osmar Fontenele remarked as follows: "Even if the economic results obtained from fishing were not so high, the sole advantage of freeing the livestock and the people from the carnivorous

Brazil (Contd.):

piranha would justify the cost of the work." DNOCS records indicate that catches in reservoir waters without piranha are as much as seven times more than those with piranhas.

Fish Culture: DNOCS conducts a fish-culture program for stocking all public and private waters in the Northeast, including reservoirs, lakes, and rivers. The DNOCS plan envisions the concentration of fish culture stations in key areas, where the greatest number of public and private reservoirs is located and can be serviced. Two stations are now in operation in the State of Ceara; one at Amanari Reservoir; another at Lima Campos Reservoir. Two stations are under construction at Itans Reservoir, Rio Grande do Norte, and at Jacurici Reservoir, Bahia. A fifth station is planned for Poco do Cruz Reservoir, Pernambuco. The location of each of the five stations is planned so that reservoirs will be serviced within a radius of roughly 150 kilometers (93 miles).

The fish-culture program has two major functions: (1) to supply the stocking needs of public and private reservoirs; and (2) to acclimatize and introduce new species. The reservoir needs for brood stock fish are great and will increase in the next few years.

Other Activities: DNOCS directs a system known as the "Guarita da Pesca" (Fisheries Law Enforcement, Tax, and Marketing Section) on the large reservoirs under its control; the system consists of collecting statistics and taxes on the fish catch, issuing fishing licenses, enforcing fishing relations, and providing landing, processing, and marketing facilities. The DNOCS plan to improve and expand reservoir landing, processing and marketing facilities, is part of the "Guarita da Pesca" system. The plan is to improve and construct facilities at six reservoirs, namely, Araras Reservoir, Ceara; Pentecoste Reservoir, Ceara; Oros Reservoir, Ceara; Curema Reservoir, Paraiba; Jacurici Reservoir, Bahia; and Poco do Cruz Reservoir, Pernambuco. Modest accommodations and fish-landing facilities will be built at the smaller stations around the reservoirs. Ice, gear, and other supplies will be made available to fishermen at cost. Instruction and extension-type services are planned at the stations for the benefit of the fishermen. A limited number of stations at each reservoir will be de-

veloped into larger marketing centers; they will have cold-storage facilities and ice-making plants, and will serve as supply stations and distribution points for fish destined for the markets of the larger cities. The plan, if carried out, will (1) greatly improve conditions and efficiency in fish handling, processing, and marketing; (2) improve the quality of fishery products; (3) facilitate the movement of increased amounts of fishery products through domestic trade channels to the consumer; and (4) undoubtedly result in increased economic benefits to the fishermen, wholesalers, and retailers.

--By Robert Balkovic, Loyal G. Bouchard, John Crum, J. Bruce Kimsey, Charles Lee, and Wm. Ellis Ripley.



Canada

TUNA PURSE SEINER LAUNCHED AS EAST COAST TUNA PROJECT MOVES FORWARD:

The Golden Scarab, one of the world's largest tuna seiners, was launched November 4, 1964, by a Quebec shipyard. Scheduled to begin her maiden voyage in January 1965, the vessel is expected to start a tuna canning industry on Canada's East Coast. A sistership, the Silver Scarab is under construction. Each vessel will have a capacity for 780 tons of frozen tuna. The vessels will deliver their catch to a tuna cannery being built at St. Stephen, New Brunswick. The cannery expects to be in operation by June 1965 and to sell \$3 million worth of canned tuna in 1966.

The Golden Scarab and the Silver Scarab each cost \$1.8 million of which 40 percent was contributed by the Canadian Federal Government and 10 percent by the Province of Quebec under fishing vessel subsidies.

The Golden Scarab measures 170.5 feet overall. Powered by a 10-cylinder Diesel engine developing 1,666 horsepower, she will have a loaded service speed of 12.5 knots at 750 r.p.m. Cruising range is 18,000 miles, and the vessel can stay at sea for 120 days. The vessel's refrigeration plant holds fish at 15° F. It is operated by three ammonia compressors. A helicopter will be carried by the Golden Scarab to scout fish.

The nylon seine of the Golden Scarab weighs 28 tons and is 4,000 feet long and 420 feet deep. It is reported to be one of the largest seines ever built.

The tuna canning plant being built in New Brunswick may be closer than California to some of the traditional Pacific tuna grounds off Central and South America. Also, the two vessels will exploit the large skipjack and bluefin tuna populations of the Atlantic. Each vessel is expected to land about 3,000 tons of tuna a year. (Western Fisheries, December 1964.)

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LARGE STERN TRAWLER LAUNCHED:

The largest trawler ever built in Canada, Acadia Albatross, was launched on November 23, 1964, from a shipyard in La-uzon, Quebec.

The Acadia Albatross is a stern trawler with a shelter deck. It is said to be capable of catching and handling 7 million pounds of fish a year.

Canada (Contd.):

Main specifications of the vessel are: length overall 152 feet, length between perpendiculars 130 feet, breadth molded 33 feet, depth molded (shelter deck) 22½ feet, and gross tonnage about 625 tons.

The vessel is of all-welded steel construction and is strengthened for navigation in ice. It has a raked soft-nosed stem (flared at bow) and a wide stern with ramp (with gates fitted between bulwarks at the top of ramp). The new trawler has two continuous decks. Machinery and accommodations are located forward of amidships.

A fixed type of fishing gantry is fitted on the shelter deck aft at stern. Forward of the stern ramp is a fish-handling gantry which, in combination with another gantry formed by the exhaust pipes, handles the fish and fishing equipment.

The deck machinery, which is generally of the electrically-operated type, consists principally of one 4-barrel trawl winch situated on the shelter deck aft of the bridge and two 1-ton capstans located right aft on the shelter deck.

The washing and handling of fish is done under cover between decks. Fish are landed on the shelter deck and then led through a hatch to the fish-handling area below. There the fish are cleaned. After cleaning, the fish are taken by conveyor belts to three hatches serving the insulated fish hold. All doors and hatches in the system are hydraulically-operated.

The vessel is equipped with modern navigational aids including radar, radiotelephone, loran, and echo-sounders arranged on a central console in the wheelhouse.

Propulsion is by marine Diesel engine and controllable pitch propeller controlled directly from the wheelhouse. (*Canadian Fisherman*, January 1965.)

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FLOATING FISH FACTORY PLANNED:

A \$500,000 floating fish plant to process groundfish fillets is to be built in Liverpool, Nova Scotia, and is expected to be in operation early in 1966, according to the Trade and Industry Minister of Nova Scotia.

The project is being developed by a private firm with the aid of a \$190,000 subsidy from the Maritime Commission of Nova Scotia. In addition, a \$390,000 loan for the project was approved by the Nova Scotia Government.

Three fishing vessels being built to help supply fish to the floating plant will boost the overall cost of the project to more than \$1,000,000.

The plant will be built on a floating barge (160 feet long and 40 feet wide) because preparation of a land site in Liverpool was not economically feasible. The floating plant will be capable of handling about 10 million pounds of groundfish annually on its production line. About 60 people will be employed at the plant.

The floating plant will have three decks. Storage space and a compact fish meal plant to use fish waste will be housed on the bottom level. Upper decks will be for holding, processing, freezing, and cold-storage facilities.

Fish will move in a straight line from a conveyor bringing them to the upper deck through various processing stages. Processed fish will be dispatched for fresh shipment or freezing and cold-storage.

The floating fish factory will create jobs in the Liverpool area, not only through plant employment but also by making a ready market available for inshore fishermen.

"The eventual application of such a plant, and others like it, would be to move it to areas not served by nearby land-based plants," a company spokesman said. "For example, such a plant could be moved to a Gulf of St. Lawrence site during good fishing periods, then be moved out when ice closed harbors. This type of plant construction also cuts other costs, particularly public works such as piers and highways." (*Fishing Gazette*, November 1964.)

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FEDERAL-PROVINCIAL BRITISH COLUMBIA FISHERIES COMMITTEE MEETS:

Topics of vital importance to British Columbia fisheries were discussed at a meeting of the Federal-Provincial British Columbia Fisheries Committee held in Ottawa, during November 1964. The Committee reviewed problems affecting the maintenance and development of the salmon resource in fresh-water areas. The problems include the effects of logging, gravel removal, pollution, and other water-use projects upon the fresh-water environment. Ways of assuring that major salmon spawning areas be preserved are to be explored with the appropriate government departments.

At the meeting, the need was recognized for long-term studies dealing with the effects of patterns of forest cover removal on the capacity of streams to produce salmon. Because of the major problem of pollution, the Committee recommended the establishment of a program working party to review pollution studies of various fisheries agencies.

Canada (Contd.):

The Committee discussed the existing administration of the oyster resource. It was agreed that the management of the oyster fishery and its public health aspects require review. The Committee accepted the fact that further experimentation and research are desirable to develop more effective utilization of oyster grounds, and concurred that a review of purification techniques for possible application in the Pacific area would be of value. The subject of administration of the oyster resource is to be discussed with other agencies concerned at the next meeting of the Committee.

Sport and commercial salmon fisheries also were on the agenda for the meeting. While the Department of Fisheries of Canada is responsible for administration of those fisheries in tidal waters, their well-being is of importance to the Province of British Columbia. Because the sport fishery is expanding rapidly and is related to tourism, the province expressed interest in the status of the chinook and coho fisheries in the Gulf of Georgia and Victoria areas where the major concentration of the sport fishery is found.

A subcommittee is to be formed to periodically consider tidal salmon sport fishing regulations and conservation problems with respect to coho, chinook, and steelhead salmon. (Canadian Department of Fisheries, November 26, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 79.

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SYMPOSIUM ON THE ECONOMIC ASPECTS OF SPORT FISHING:

A 3-day symposium on the economic aspects of sport fishing was held in Ottawa, Canada, January 5-7, 1965. It was sponsored by the Department of Fisheries of Canada. The meeting was attended by about 75 biologists, administrators, and economists from all parts of Canada, as well as several from the United States.

The meeting was opened by the Canadian Federal Deputy Minister of Fisheries who said that the Canadian Government was aware of the difficulty in reconciling the regulation of fisheries for commercial purposes with those of recreation. While it is relatively easy to assess the value of commercial fisheries, it is very difficult to do so for sport fishing. The recreational value in itself is important, and in addition, sport fishing, like commercial fishing, supports a large industry. If fisheries are to be regulated in the best interests of the people, however, something must be known of the value of sport fishing as well as commercial fishing.

The Chairman of the Fisheries Research Board of Canada said that problems faced by economists in considering the sport fisheries held similarities to those which faced biologists in fish population studies.

A paper prepared by Dr. Marion Clawson, of Washington, D.C., was read at the symposium. The paper detailed the extent of the boom in outdoor recreation in the United States and explained that the basic factors underlying the outdoor boom were population changes, growth in per capita income, improved travel facilities, and increased leisure. As total population has grown, so has the number of elderly retired and semiretired people and the number of young people not yet in the labor force, two classes with special demands for outdoor recreation.

In foreseeing a greater demand for sport fishing in the future, Dr. Clawson said that perhaps it would also be less discriminating, and that a period of "mass fishing" may develop before too long. The problems of those responsible for fisheries management could then shift from fish to people--how to educate, help, guide, and hopefully satisfy the recreationists seeking some fishing, consistent with proper management. That would inevitably impose new and different burdens upon researchers and managers alike. Traditional methods would no longer suffice and greater research would be needed.

Information on expenditures made by fishermen is often collected, but its value is by no means clear. The major question is what items of expenditure to include and how to assess the value of the sport fishery in monetary terms, apart from its known value from a recreational standpoint.

The symposium on sport fisheries included panel discussions on "The Basis for an Economic Approach," "Techniques and Methods of Evaluation," "The Economics of Management," "Research Requirements," and "Statistical Needs."

The growth of sport fishing was given further emphasis during the panel discussion on research requirements. Although many of the untold thousands of sport fishermen may be inefficient, the results of their activities can be "terribly effective" with regard to fish stocks.

The panel on research requirements received a paper by the Director of the Atlantic Laboratory of the U. S. Bureau of Sport Fisheries and Wildlife. He discussed the need for research in salt-water sport fisheries. By 1960, he said, over 6 million anglers were fishing at one time of the year or another along United States coasts. They were spending about \$626 million in pursuit of their sport and were increasing in numbers by about 350,000 a year. In the case of some species of fish, sportsmen account for a larger catch than commercial fishermen.

A basic need in a program of sport fishery research, he said, is statistics which are comprehensive, systematic, and accurate. How to gather such data is a problem.

He said the habits of fishermen, as well as of fish, must be studied. The livelihood of many people depends on sport fishing. There have been many changes in the use of fishery resources and in the public's attitude toward them. These changes must give direction to research requirements.

Canada (Contd.):

A paper discussing the biological research required in management of fresh-water sport fisheries was presented by a Canadian scientist from Vancouver, B.C. He discussed research bearing on physical and chemical aspects of the fresh-water environment as well as of that pertaining to fish and other organisms of importance to sport fish. He also stressed that man himself was a biological factor with which research was involved.

The final paper on research requirements was presented by a scientist from Acadia University, Wolfville, N.S. He stated that there is a need for units to measure supply, and that until a curve can be drawn showing the long-run supply of sport fish resources, a complete range of economic problems defies or eludes economic analysis. It is possible to obtain information about the utilization of the resource in real terms such as in rod days and number of fishermen, but such information falls short of that necessary for the analysis of demand in terms of money.

The last panel discussion was on statistical needs in the marine sport fishery for Pacific salmon in British Columbia. The paper on which that discussion was based was prepared by a member of the Canadian Department of Fisheries in Vancouver, B.C. He said that neither the existing statistics nor the methods by which they are gathered are adequate to the challenge now emerging in the recreational salmon fishery. Major programs of biological study have already been undertaken on sport fishing and these need to be matched with at least a comparable level of catch and effort information.

At the close of the symposium, the Canadian Deputy Minister of Fisheries said he hoped that the stimulating statements which emerged during the conference would increase efforts to find a way to make meaningful economic analyses of the sport fisheries.

A summary of the discussion at the symposium was given by the Director of the Namaimo, B.C., Biological Station of the Fisheries Research Board of Canada. He spoke of the difficulties encountered by biologists and economists in assessing the value of a recreation such as sport fishing because of the variety of intangibles involved. He thought that more attempts should be made to forecast trends in sport fishing so that future demands on the resource might be better assessed. (Canadian Department of Fisheries, Ottawa, January 5 and 7, 1965.)



Cyprus

TERRITORIAL WATERS
OF 12 MILES CLAIMED:

An extension of the territorial waters of the Republic of Cyprus to 12 miles was declared by law No. 45 of the Cypriot Parliament, published August 6, 1964. The action was protested by the Turkish Government, which claimed that Turkish Cypriot Repre-

sentatives had been barred from the Cypriot Parliament and prevented from taking part in deliberations which led to the new law on territorial waters. (Turkish Permanent Mission to the United Nations, New York, December 22, 1964.)



Denmark

WESTERN EUROPEAN
FISHERIES CONVENTION RATIFIED:

The Danish Parliament approved on May 29, 1964, Special Bill XVI agreeing to Denmark's ratification of the March 9, 1964, London Fisheries Convention approved at the Western European Fisheries Conference in London. The Danish documents were deposited in the United Kingdom archives in London on October 9, 1964.

Danish fisheries limits have not been extended pending discussions with neighboring countries having historic fishing rights under the Convention, and approval of a new Salt Water Fisheries Law still under consideration in the Folketing. Danish Fisheries Ministry officials stated extension of limits probably would occur at the same time as passage of the Salt Water Fisheries Law. (Regional Fisheries Attache, United States Embassy, Copenhagen, January 13, 1965.)

Note: See Commercial Fisheries Review, August 1964 p. 61.

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SEAL SKINS FROM ALASKA
INCLUDED IN AUCTION OF
GREENLAND SEAL SKINS:

The Royal Greenland Trade Department held one of its regular auctions for Greenland seal skins on September 9, 1964, in Copenhagen, Denmark. Included in the auction for the first time were 2 lots of Alaska hair seal skins designated as Alaska rangers (from younger and smaller seals) and Alaska saddlers (from older and larger seals). There have been reports that the Alaska seal skins were taken from southwestern and central Alaska by bounty hunters.

During the auction, a total of 21,316 ringed seal skins from Greenland were sold at an average price of US\$20.40 a skin. A total of 849 other Greenland skins (from harp, bladder-nosed, and saddle seals) were sold at somewhat higher average prices.

Denmark (Contd.):

A total of 2,450 Alaska ranger seal skins were sold at an average price of \$33.20 a skin. The price spread for the Alaska rangers was \$31.10-38.40 for 2,000 prime young washed skins and \$22.45-39.80 for 450 prime old washed skins. A total of 50 Alaska saddler skins were sold for \$36.90 each.

It was reported that the Alaska seal skins were not sorted as uniformly as is the practice for Greenland skins. Better prices for the Alaska skins would be expected if they were sorted more uniformly. It was not known if more Alaska seal skins would be offered at the next auction of the Royal Greenland Trade Department which was scheduled for February 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, November 11, 1964.)



Ecuador

CANNED TUNA EXPORTED TO BRAZIL:

An Ecuadorean tuna cannery owned by United States interests has announced its first shipment of canned tuna to Brazil. The shipment consisted of 1,500 cases (48 1-lb. cans) of fancy solid pack. The sales manager of the Ecuadorean tuna cannery, which is located at Manta, had to make several trips to Brazil to develop the sale. (United States Embassy, Quito, December 11, 1964.)



Faroe Islands

FAROESE VESSEL TO LONG LINE FOR TUNA IN CARIBBEAN:

The Faroese owners of the M/V Skugvur plan to send the vessel to the Caribbean to long line for tuna. Built in a Norwegian shipyard during 1964, the vessel has already made a trip to the northeast coast of the United States to long line for porbeagle (herring shark).

Main dimensions of the Skugvur are: length 172 feet, breadth 30 feet, depth 16 feet, and tonnage 646 gross tons (312 net tons). Speed is 12 knots.

The vessel is equipped with the latest electronic aids to fishing and navigation. The en-

gine is automatically-controlled from the bridge. A variation of the Kort Propellor enables the vessel to make tight turns during purse-seine operations. The vessel is air-conditioned for work in tropical waters. It carries fresh-water generators with a capacity for distilling 2 metric tons of fresh water a day and a flake-ice machine with a capacity of 3 tons a day. The vessel has two blast freezers which can freeze 20 tons of fish a day at -10° F. Lower temperatures can be reached, but with reduced daily output.

The Skugvur was built for the porbeagle fishery. Owing to a combination of poor fishing and unfavorable conditions in the Italian market for porbeagle, the owners have decided to try the vessel at tuna long-lining in the Caribbean, probably operating out of Barbados in the West Indies. The vessel had been considered for use in conjunction with a United States-Somali fishing project which was cancelled in 1964. It recently carried a cargo of frozen fish fillet waste for use as mink food from Nova Scotia to Norway. (Assistant Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 6, 1965.)



Greece

FREEZER-TRAWLER FISHERY TRENDS, SEPTEMBER 1964:

Landings: The Greek fleet of Atlantic freezer-trawlers landed 14,749 metric tons of fish in the first 9 months of 1964 compared with 14,352 tons in the same period of 1963 and 11,888 tons in January-September 1962.

Exports: One of the Greek fishing companies operating freezer-trawlers in the Atlantic has sold Bulgaria 400 tons of frozen fish (mackerel and horse mackerel). The shipment was delivered to the port of Pyrgos (Burgas), Bulgaria, by the Greek firm's refrigerated vessel Evangelistria V. The same Greek firm has also exported 50 tons of frozen cuttlefish and squid to Italy, and has prospects for further exports.

Freezer-Trawler Fleet Expands: Nine additional freezer-trawlers are scheduled to join the Greek fleet in 1965 and fish off Northwest Africa. The new vessels were acquired from foreign owners in Germany, France, and Iceland. The vessels are being adapted for

Greece (Contd.):

work as freezer-trawlers by shipyards in Piraeus (Piraeus), Greece. (Alieia, October 1964.)



Guinea

TERRITORIAL WATERS OF
130 MILES CLAIMED:

By Presidential Decree No. 224 dated June 3, 1964, the Government of Guinea declared its territorial waters were extended to 130 nautical miles calculated on the basis of straight baselines.



The United States has declared that a unilateral extension of territorial waters is not recognized under international law, and that the United States reserves its rights and those of its nationals in the waters in question. The extension of Guinean territorial waters was also protested by the Japanese Government.

It appears that the purpose of the extensive territorial waters claim by Guinea was to establish an exclusive 130-mile fishing preserve for Guinean fishermen.



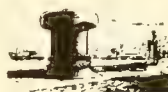
Ireland

GOVERNMENT ANSWERS PROTESTS
BY LOCAL FISHERMEN OVER
SPANISH LANDINGS AT IRISH PORT:

Angry demonstrations by Irish fishermen marked the arrival in early December 1964 of a Spanish trawler to unload fish at the Irish port

of Galway. Protests were also made to the Irish Parliament. Involved in the conflict is a fish-processing factory at Galway which needs regular raw fish supplies to meet export requirements for fish sticks, fish balls, and related products. Landings by Irish fishermen have been inadequate to meet the factory's requirements, so a Spanish trawler was licensed by the Government of Ireland to supplement domestic supplies.

In the Irish Parliament on December 9, 1964, a Government spokesman defended the issuance of the license to the Spanish trawler. He emphasized the importance of the processing sector of the fishing industry in the development of a national fisheries policy; factories must be assured of regular and adequate supplies. He said contractual arrangements between Irish fishermen and the factories would be promoted so that adequate supplies would be available from Irish sources. But until that was done, landings of fish by foreign trawlers to supplement rather than supplant local catches was necessary so that export orders could be met. Since those landings would be processed and re-exported, the interests of Irish fishermen would not be adversely affected. (United States Embassy, Dublin, December 11, 1964.)



Ivory Coast

FISHERY DEVELOPMENT
PLANS BEING REALIZED:

Plans for the development of the commercial fisheries of the Ivory Coast were being realized by the end of 1964 when the construction of warehouses for fishing gear and equipment and other auxiliary buildings was completed. Most of the new buildings were in operation but construction of the cold-storage plant (planned for the new "Port de Peche" or Fishing Port), which had been reported as being 25 percent completed in the summer of 1964, had not been started as of the beginning of 1965.

Specifications for the cold-storage plant were changed from a storage capacity of 1,500 tons to at least 3,000 tons. Construction bids from 4 companies (2 French and 2 United States firms) were to have been submitted this past January. It was reported that actual construction of the plant would be delayed until the completion of at least part of a new

Ivory Coast (Contd.):

1,300-foot L-shaped addition to the dock of the same length, which has been completed and is in use. This will probably be about the latter part of 1965. (Fisheries Attache, United States Embassy, Abidjan, January 9, 1965.)

Note: See Commercial Fisheries Review, October 1964 p. 60.



Jamaica

FISHERIES DEVELOPMENT PROJECT CONSIDERED:

An offshore fisheries development project costing £3.5 million (US\$9.8 million) is being considered by the Jamaican Government, according to an announcement by the Jamaican Minister of Development and Welfare. The Minister mentioned the project on October 20, 1964, when he opened the Jamaican annual All-Island Fishermen's Cooperatives Conference. The conference was attended by representatives from the 65 fishing cooperatives in Jamaica. The Minister told the conference that the development project under study proposed not only to improve fisheries landings for domestic consumption but also to provide an export surplus. The proposal has provisions for a fish-canning operation, and the over-all project could lead to the employment of 1,000 people.

Pointing out that Jamaica was continuing to import canned fish, the Minister said he would like the country to become self-sufficient in fish with an export surplus. He said Jamaican landings of fish in 1963 totaled 1,500 tons. The Minister strongly supported the principle of operating through fishery cooperatives.



The Minister also told the conference about the fisheries project in the Caribbean region sponsored by the United Nations Special Fund. The Special Fund project is designed to provide through exploratory fishing, market studies, and training, a basis for fish-

eries development in Caribbean countries. The cost of the project to the Special Fund will be about \$1.5 million. The Caribbean countries participating will contribute about \$750,000. The Minister emphasized that the proposed Jamaican fisheries project was separate from and in addition to the United Nations Special Fund project in the Caribbean. (United States Embassy, Kingston, November 26, 1964.)



Japan

FROZEN TUNA EXPORT QUOTAS FOR FY 1965:

The Japan Frozen Foods Exporters Association, on January 12-13, 1965, held a meeting of its Tuna and Overseas Base Committees to draft the agreement on frozen tuna export quotas for the business year 1965 (April-March 1966). At that meeting the committee members unanimously agreed to propose that the Association adopt the existing export quota allocations for the new business year, as follows:

Exports to:	
United States and Canada	110,000 short tons ^{1/}
Other Countries	70,000 metric tons
Overseas Bases:	
American Samoa	25,000 short tons
Fiji Islands	9,000 " "
Noumea (New Caledonia) ^{2/}	7,500 " "
Espiritu Santo (New Hebrides)	6,000 " "
Penang (Malaysia)	6,000 " "
Saint Martin (West Indies)	2,000 " "

^{1/}Excludes exports of tuna loins and frozen tuna transshipments from overseas bases.

^{2/}Base, established in 1963, no longer exists but quota continues to be allocated. The fishery firm assigned the quota can utilize it by reactivating base or by obtaining permission to transfer quota to another overseas base.

Source: Suisan Tsushin, January 14, 1965.

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EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO U.S., JANUARY-NOVEMBER 1963-64:

Japan's export validations of frozen tuna and frozen tuna loins to the United States in November 1964 totaled 7,723 short tons. Of that total, 62.5 percent were albacore tuna, 24.8 percent yellowfin, 1.4 percent skipjack, and 11.3 percent tuna loins.

During January-November 1964, Japan's export approvals amounted to 104,480 short tons, an increase of 32,236 tons or 44.6 percent more than the 72,244 tons exported during the same period in 1963. On a species basis, albacore exports were up 67.9 percent, yellowfin 30.5 percent, skipjack 5.9 percent, and tuna loins 12.2 percent. Exports of big-eyed tuna were down 2 percent. Only one ton of bluefin tuna fillets was exported as compared with 374 tons shipped during the same period in 1963.

Japan (Contd.):

Japan's Export Validations of Frozen Tuna and Tuna Loins to U. S., January-November 1964 with Comparisons										
Species	November 1964			January-November 1964			January-November 1963			1963
	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Total
	(Short Tons)									
Albacore, round	1,347	3,478	4,825	24,351	32,099	56,450	11,220	22,396	33,616	36,737
Yellowfin:										
Round	-	130	130	-	1,535	1,535	-	861	861	
Gilled and gutted:										
20/100 lbs.	1,087	469	1,556	25,291	4,010	29,301	18,348	3,976	22,324	
100 lbs. up	34	-	34	2,381	-	2,381	1,248	-	1,248	
Dressed with tail	9	186	195	87	4,537	4,624	-	4,160	4,160	
Fillets	-	-	-	33	12	45	296	132	428	
Total	1,130	785	1,915	27,792	10,094	37,886	19,892	9,129	29,021	33,370
Big-eyed:										
Gilled and gutted	-	4	4	30	39	69	24	4	28	
Dressed with tail	-	-	-	-	201	201	-	240	240	
Fillets	-	-	-	37	3	40	6	42	48	
Total	-	4	4	67	243	310	30	286	316	316
Bluefin, fillets	-	-	-	-	1	1	-	374	374	374
Skipjack, round	-	106	106	8	3,135	3,143	-	2,967	2,967	3,762
Loins:										
Albacore	537	-	537	3,283	-	3,283	2,707	-	2,707	
Yellowfin	336	-	336	3,407	-	3,407	3,086	-	3,086	
Bluefin	-	-	-	-	-	-	157	-	157	
Total	873	-	873	6,690	-	6,690	5,950	-	5,950	6,183
Grand Total	3,350	4,373	7,723	58,908	45,572	104,480	37,092	35,152	72,244	80,742

Source: Japan Frozen Food Exporters Association.

Frozen tuna and tuna loins approved for export during January-November 1964 exceeds the total amount exported during all of 1963 by 23,738 tons. (Fisheries Attache, United States Embassy, Tokyo, December 18, 1964.)

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TUNA FISHING AND MARKET TRENDS:

Japanese tuna vessels early in January 1965 were shifting their operations from the winter albacore fishing grounds in the western Atlantic to the yellowfin grounds in the eastern Atlantic. Average catches of 3-4 metric tons a day, consisting of 60 percent yellowfin, were reported.

Exports of frozen dressed yellowfin tuna to Italy brought US\$420 a metric ton c. & f. In comparison, frozen gilled-and-gutted yellowfin tuna exported to the United States from Japan proper were quoted at \$370-375 a short ton c. & f. Frozen round albacore for export to the United States were quoted at \$270-275

a short ton f.o.b. port of delivery, Africa. (Suisan Tsushin, January 18, 1965, and other sources.)

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TUNA VESSEL RESEARCH GROUP TO BE FORMED:

In an effort to assist the tuna fishing industry in stabilizing the management of fishing vessels and in improving working conditions aboard those vessels, the Japanese Fisheries Agency plans to organize a research group to develop ways and means of reducing manpower on tuna vessels. Under the plan announced by the Agency, a research group comprised of leading experts from the Government and industry will be organized and placed under the supervision of the Agency's Production Division Chief Kamenaga. Its activities will be carried out in cooperation with the Japan National Tuna Research Council.

Japan (Contd.):

Projects to be assigned to the research group include the design and development of: (1) equipment to mechanize fishing operations on tuna long-liners; (2) mechanical devices to facilitate fish handling and freezing aboard the vessel; (3) automatic steering mechanism for slow-speed vessel operation during fishing; and (4) other technological improvements of fishing vessels. The projects are tentatively scheduled for completion by the end of 1965. (Suisancho Nippo, December 28, 1964.)

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TUNA MOTHERSHIP FISHERY
TRENDS IN SOUTH PACIFIC:

The Japanese tuna mothership Shinyo Maru (3,800 gross tons) returned to Tokyo on January 15, 1965, after a 103-day trip to the South Pacific. The mothership returned with 3,164 metric tons of frozen fish, consisting of 46 percent albacore tuna, 15 percent yellowfin tuna, 7 percent other tuna species, 20 percent spearfish, 8 percent shark, and 4 percent miscellaneous species. The Shinyo Maru's operation is said to have ended in a deficit due to lower than anticipated production and the preponderance of albacore in the catch, prices for which are presently depressed. Catcher vessels fishing for the mothership totaled 34, including two transport vessels. They averaged 1.92 metric tons of fish a day.



Retrieving long-line gear aboard a Japanese tuna long-line catcher boat. Note the long-line hauler.

The tuna mothership Yuyo Maru (5,500 gross tons), which belongs to the same firm that owns the Shinyo Maru, is scheduled to depart for the South Pacific in mid-May. The Yuyo Maru made a profit on its last trip.

On the other hand, another fishery firm recorded a loss in its South Pacific tuna mothership operation in 1964, and it does not plan to conduct mothership-type operations in 1965. That firm's fleet, led by the mothership Nojima Maru (8,800 gross tons), operated in the vicinity of Tahiti in the summer of 1964. (Suisan Tsushin, January 18, 1965.)

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TUNA PURSE-SEINE FLEET OFF WEST
AFRICA REPORTS POOR FISHING:

The Japanese tuna purse-seine fleet, led by the mothership Chichibu Maru No. 2 (1,639 gross tons), has been operating in the waters off West Africa. It reported poor fishing at the end of 1964 and in early January 1965. The fleet began fishing on November 17 and, except for a short period soon after it commenced operations, fishing has been poor. (Suisan Tsushin, January 13, 1965.)

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TUNA CANNERS ADOPT
NEW SALES PROCEDURE:

The Japan Export Tuna Packers Association, at a directors meeting held January 8, 1965, to discuss the new export sales procedure approved at the previous directors meeting, formally adopted the original proposal and supplementary provisions as follows:

1. Packers will contract sales with exporters who have outlets in the United States and who will aggressively promote sales to help establish a firm market in that country for Japanese canned tuna.
2. Sales goal will be the attainment of the 1965 canned tuna in brine import quota admissible into the United States under the lower duty rate of 12½-percent ad valorem. However, when market conditions indicate it would be advantageous to export canned tuna in excess of that quota (packers to assume obligation of paying for the increase in duty), a decision on whether to exceed the quota admissible under the lower duty rate will be made each time such a situation occurs.

3. Exporters will present their annual sales plan within a specified date to the Packers Association on forms to be prescribed separately.

4. With regard to advance purchase orders submitted by exporters on the basis of their an-

Japan (Contd.):

nual sales plan, the Sales Committee (representing packers), in consultation with the exporters, will determine the quantity of advance orders in a manner which would enable exporters to fulfill their targets. As a rule, supplementary contracts will not be made.

5. To assure sales and shipment of canned tuna purchased in advance, the exporters will conclude purchase contracts with packers on a progressive scale based on their sales plan.

6. The advance purchase plan will be formulated on a quarterly basis if that is considered particularly advisable under prevailing circumstances.

7. The basic sales contract and the sales contract to be drawn up will stipulate sales conditions. The basic sales contract shall be drawn up at the time that the quantity of advance purchase is determined by the exporters on the basis of their annual sales plan. The sales contract shall be prepared each time a sale is transacted.

8. A reasonable sales price based on existing market conditions in the United States will be determined by the packers at the directors meeting. When a price change becomes necessary, it will be announced as early as possible.

9. Packers may designate outlet (trading) firms to handle their allotted production quotas, in which case they must notify the packers association. Such packers may consult their outlet firms on matters related to the kind and size of pack. The Packers Association will recognize such firms as designated exporters so long as this presents no special problem. When necessary, the Association will give those firms priority over other firms in handling the sale of canned tuna products.

10. The kind and size of pack to be put up by packers who do not have their own designated outlet (trading) firms will be determined under the usual method following consultations with exporters.

11. Joint accounts and other matters, including those related to delivery, will be handled in the same manner as before.

Supplementary provisions: (1) It is understood that the advance purchase orders stipulated in Paragraph 4 will be submitted to the Tokyo Canned Tuna Sales Company; and (2) it is further understood that the provisions in Paragraphs 9 and 10 are applicable provided they present no problem, and that those provisions shall be studied further. (Suisan Tsushin, January 9, 1965.)

Note: Japanese canned tuna exporters and packers have not yet reached settlement on a new agreement covering the export of canned tuna to the United States for the business year December 1964-November 1965. The preceding 11-point proposal prepared by the packers has been submitted to the Exporters Association for its concurrence.

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DEVELOPMENTS ON SUSPENSION OF CANNED TUNA EXPORTS TO UNITED STATES:

According to an article in the Japanese periodical Nihon Kogyo, December 15, 1964, Japan stopped exporting canned tuna to the United States as of December 1, 1964. The reason for the suspension was because of a difference of opinion between Japanese canners and traders on the policy for the sale of canned tuna to the United States during the business year 1965 (begins December 1). Canned tuna packers have been shipping their products for export to the Japan Canned Tuna Export Fisheries Union. That Union has been exporting the products after consulting with the Japan Canned Food Export Union.

Japanese tuna canners were scheduled to hold a meeting of the Board of Directors on December 16 to again discuss their export policy. It was reported that the keynote of their policy is to "establish in the United States a market for Japanese canned tuna," but with no intention to change the policy of relying on the big trading firms for greater sales. They also hold that the canners can designate their trading firms within the framework of production, while the trading firms' agreement calls for export quotas based solely on the actual exports in the preceding year.

It was pointed out that it is necessary for the canners and trading firms to reach an agreement through talks, apart from whether or not the trading firms' agreement should be recognized. It was reported that the Japanese Fisheries Agency strongly wants such an agreement.

The Japanese report that sales of Japanese canned tuna in the United States dropped in

Japan (Contd.):

1964, and that inventories of the Japanese product in the U.S. total 400,000 or 500,000 cases.

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TUNA INDUSTRY URGED TO REDUCE RELIANCE ON GOVERNMENT ASSISTANCE:

Japanese tuna industry leaders, on December 24, 1964, held a meeting in Tokyo to exchange views with State Minister Ichiro Kono and Fisheries Agency officials on problems confronting the depressed tuna industry. Matters discussed at that meeting included the voluntary reduction of the fishing fleet, international regulation of the tuna fisheries, labor-management improvement, and tuna price problems.

In addressing the industry leaders, the State Minister commented on the great gap between his views and those of industry. He expressed the hope that industry would understand that the Government's fishery policy is changing with the times. Heretofore, the Government had pursued a protective policy for the producers, but with changing economic conditions main emphasis of the administration's policy must be directed toward the consumers. The Minister stressed that the industry should try to resolve its own problems and seek government assistance only where such help is needed, and that it must first of all reduce production costs to successfully compete with other countries. (Suisancho Nippo, December 25, 1964.)

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GOVERNMENT ARBITRATES ALLOCATION OF BERING SEA KING CRAB PRODUCTION QUOTA:

The nine Japanese fishing companies which jointly operate the king crab factoryships Tokei Maru (5,385 gross tons) and Dainichi Maru (5,858 gross tons) in the eastern Bering Sea were unable to resolve their differences of views on the allocation of the reduced king crab production quota of 185,000 cases. That quota was agreed to at the negotiations held between Japan and the United States in the fall of 1964. Thus the firms arranged for the Fisheries Agency to arbitrate their dispute. On January 16, 1965, the Agency ruled that each company's quota would be reduced by 21.28 percent. The fractional shares of less than one case, totaling three cases, were al-

lotted to the firm with the smallest production quota. The annual quota for 1965 and 1966 for the Tokei Maru fleet (operated by 4 firms) is 94,467 cases and the Dainichi Maru fleet (operated by 5 firms) 90,533 cases.

Those two factoryships will be licensed to operate in Bristol Bay during the 1965 season until the king crab production quota of 185,000 cases (48 $\frac{1}{2}$ -lb. cans) is attained. Production by the two vessels in 1964 was 235,000 cases. (Suisan Tsushin, January 18; Suisan Keizai Shimbun, January 12; Fisheries Attache, United States Embassy, Tokyo, January 22, 1965.)

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COMPOSITION OF BERING SEA BOTTOMFISH FLEETS:

On January 19, 1965, the Japanese Fisheries Agency submitted for consideration of the Central Fisheries Coordination Council (highest Government-industry advisory body on fisheries matters) a list showing the composition of the mothership-type bottomfish fleets scheduled for operation in the Bering Sea in 1965. According to the Agency's sub-



Typical Japanese small otter trawler in the Bering Sea fishing for a mothership.

Composition of Bering Sea Mothership Bottomfish Fleets, 1965

Mothership	Size	No. Catcher Vessels
	<u>Gross Tons</u>	
Gyokuei Maru	10,357	28
Shikishima Maru	10,144	23
Aso Maru	3,500	1
Tenyo Maru	11,581	15
Soyo Maru	11,192	30
Einin Maru	7,482	15
Meisei Maru No. 2	9,300	8
Chichibu Maru	7,420	12
Hoyo Maru	14,111	30
Seifu Maru	8,269	28
Itsukushima Maru	5,871	18
Taiyo Maru No. 82	2,840	1
Kotoshiro Maru No. 15	700	3
Tone Maru	535	2

Japan (Contd.):

mission, 14 motherships and 214 catcher vessels will be authorized to engage in the Bering Sea bottomfish fishery. In 1964, 14 motherships and 228 catcher vessels were licensed to engage in that fishery. (Suisancho Nippo, January 20, 1965.)

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TRAWLER FLEETS DEPART FOR BERING SEA:

The Japanese shrimp factoryship Chichibu Maru (7,420 gross tons), accompanied by 9 trawlers, departed for the eastern Bering Sea from Hakodate on January 20, 1965. Three additional trawlers were expected to join the shrimp fleet later.

The 3,500-ton stern trawler Aso Maru, accompanied by one small trawler, was scheduled to depart Tokyo for the eastern Bering Sea on January 21. (Suisancho Nippo & Suisan Tsushin, January 20, 1965.)

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SEASONAL SAURY FISHERY DISAPPOINTING:

Japan's saury landings since the opening of the season in September through November 30, 1964, totaled only 206,600 metric tons, 110,600 tons below the saury landings for the same period in 1963. The saury catch off the coast of Hokkaido was particularly disappointing. Although the quantity of saury delivered to ports located on the Pacific side of Hokkaido were slightly above the previous year, landings from the Okhotsk coast of the Island dropped from 42,390 tons in 1963 to 2,900 tons in 1964. The failure of the run to appear off the Sanriku and Joban coasts of Honshu also was disappointing.

Because of the shortage of saury and prospects of poor fishing during December 1964, the price paid to the fishermen at landing ports during the month rose to 61 yen per kilogram (about 8 U.S. cents a pound) from an average price of about 29 yen (about 4 cents) during the previous three months. (Fisheries Attache, United States Embassy, Tokyo, December 24, 1964.)

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SAURY FISHERY TRENDS:

A survey of trends in the Japanese saury fishery shows that in 1964 a proportionately

larger than usual amount of the catch was frozen as bait. This was attributed to the fact that the price of bait saury has tripled in one year. As a result, cold-storage operators are processing greater quantities of that species for bait and are planning to process sizes other than those considered to be of optimum bait size.

As of December 15, 1964, the total catch of saury was reported to be 209,600 metric tons, or slightly over 60 percent of the catch for the same period a year ago. Due to poor fishing conditions, fears were expressed earlier that there would be a severe shortage of bait saury in 1965. However, as a result of the above developments, as well as a plan being considered to encourage the wider use of other species (such as small mackerel and large sardines) for bait, the outlook for 1965 is considered much brighter. (Suisan Keizai Shimbum, December 20, 1964.)

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SALMON IMPORTS FROM COMMUNIST CHINA:

Japanese trading firms hope to import a fairly large quantity of chum salmon from Communist China in 1965. In 1964, two trading firms imported 20-30 metric tons of chum salmon at 230 yen a kilogram (US\$0.28 a lb.), but the quality was poor. The trading firms hope to provide guidance in proper processing techniques (freezing and salting) this year before the commencement of the fishing season in China.

The chum salmon were reported to be from the Amur River. (Suisancho Nippo, January 19, 1965.)

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HERRING ROE ON KELP PROVE POPULAR:

A product of Alaska, "herring roe on kelp," exported to Japan, has become a highly popular food item in that country. Reportedly, demand is very strong and supplies can barely meet demand. As a result of the strong market a certain trading firm has made a request to the firm processing that product in Japan that it be appointed exclusive agent. Consideration is now being given to putting up a new style of consumer pack containing 120 grams (4.2 oz.) of "herring roe on kelp" which would be sold for 180 yen (US\$0.50). (Suisancho Nippo, January 20, 1965.)

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Japan (Contd.):

HERRING TO BE IMPORTED FROM U.S.S.R.:

According to information released on January 8, 1965, by the Hokkaido Federation of Fishermen's Cooperative Associations (DOGYOREN), the Federation has concluded discussions with the Soviet Union to import 4,000 metric tons of Russian herring in 1965 at US\$110 a metric ton for "fresh" herring and US\$123 a ton for salted herring. In 1964, the Federation imported 3,000 tons of Russian herring at US\$95 a ton for "fresh" and US\$117 a ton for salted.

The trade agreement concluded by the Federation and the Soviet Government is subject to approval by the Japanese Government. Some sources believe that the Japanese Government may approve the importation of only 3,500 tons. (Suisan Keizai Shimbun, January 9, 1965.)

Note: Prices believed to be f.o.b.

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VIEWS ON SOVIET FISHING EXPANSION TO NEW FISHING GROUNDS:

According to the Japanese periodical Nihon Keizai, December 21, 1964, there is growing concern in Japanese fishing circles over possible competition with the Soviet fishing industry as a result of the recent appearance of Soviet fishing vessels off the Sanriku coast. As one of the top fisheries nations in the world, Japan has been almost free from pressure of foreign fishing operations on any fishing ground. The expansion of Soviet fishing operations is not overlooked by Japan, and in a few cases, the thinking is that the Japanese fishing industry is being surpassed by the Soviets.

Formerly, fishery problems between Japan and the Soviet Union have been limited to the salmon, salmon-trout, and crab fisheries in the Northwest Pacific. Those problems, such as catch quotas and regulations for fishing operations, have been under the jurisdiction of the Japan-Soviet Fisheries Commission. Now, the fishing vessels of Japan and the Soviet Union are in rivalry with each other on the following fishing grounds of the world: (1) The Soviet Union in 1964 sent a major fishing fleet to the grounds off Sanriku, which has been a mackerel-pike (saury) fishing ground exclusively for the Japanese, driving the Japanese fishing vessels into con-

fusion by the misuse of SOS lines of communication; (2) Soviets also sent another large fishing fleet to the western coast of Africa where the Japanese are developing fishing grounds for cuttlefish, octopus, and seabream. The Soviet Union has concluded "technical cooperation and aid agreements" with Ghana and other newly independent countries on the same coast, and is underselling its fishery products in those countries on the basis of "offering food to less developed countries" which is bringing about some market confusion; (3) Japan during 1964 sent only 6 trawlers to waters south of Alaska where it started its fishing activities in 1963 under the Japan-U.S.-Canada Fisheries Treaty. Japanese sources say that the Soviet Union has sent about 250 vessels to that same area.

The Japanese believe the Soviet Union has sent its mackerel-pike fishing fleet to the area off Sanriku, which borders on Japanese territorial waters, because the Soviets have started full-scale efforts for the development of northern Pacific fisheries by building in the spring of 1964 a cannery, which is said to be the biggest in the Far East, on the island of Shikotan. (The Soviet general headquarters for Far Eastern fisheries is in Vladivostok.) Japanese fisheries circles fear, above all, that the Soviet Union may advance into the field of "offshore" salmon and salmon-trout fisheries. At present, the Soviet Union is engaged in salmon and salmon-trout fisheries only at the estuaries of rivers or rivers on the sea coast, like the United States and Canada.

In recent years the Soviet Union has redoubled its efforts for the construction of refrigerator and canning factoryships. It has ordered such vessels from West Germany, and Japan^{1/} while also building them at home. Despite the concern of Japanese fisheries circles, an agreement was concluded in spring 1964 between Japan and the Soviet Union for the export of cannery vessels with favorable payment terms to the Soviets calling for deferred payment of 70 percent over a period of 5½ years. Since then, most of the major Japanese industrial firms have concluded contracts with the Soviets. In 1964 alone, Soviet orders for about 200,000 gross tons of cannery and refrigerator vessels were received by Japanese firms. Although those vessels are likely to be used mainly for tuna fisheries, Japanese fisheries circles are uneasy because such vessels can also be used for fishing salmon.

^{1/}Editor's note: Also from Poland, East Germany, Finland, and Sweden.

Japan (Contd.):

on, salmon-trout and other fisheries. (Translation from Japanese periodical Nihon Keizai, United States Embassy, Tokyo, January 4, 1965.)

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JAPANESE PREPARING FOR NORTHWEST PACIFIC FISHERIES COMMISSION MEETING:

In preparation for the Ninth Annual Northwest Pacific Fisheries Commission (Japan-U.S.S.R.) Meeting scheduled to convene at Tokyo on March 1, 1965, the Japanese Fisheries Agency planned to meet with the Foreign Ministry to exchange views and to convene a series of meetings of high-level Agency personnel. Similarly, industry organizations involved in the North Pacific fisheries were said to be rushing preparations for the Annual Meeting. To seek an adjustment of views within the industry, the Japan Fisheries Society scheduled a meeting for January 19, 1965. (Suisan Keizai Shimbun, January 10, 1965.)

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GOVERNMENT MAY RATIFY TWO CONVENTIONS ON LAW OF THE SEA:

The Japanese Government is planning to participate in the Convention on the Territorial Sea and Contiguous Zone and the Convention on the High Seas (two of the four conventions on the Law of the Sea) to cope with the problems relating to territorial waters. The Japanese Government hopes to seek Diet consent on the ratification of those two conventions, possibly as early as 1965. In view of the recent trend towards extension of territorial waters by many countries, Japan considers it more realistic to revise her thinking on the traditional concept of the three-mile territorial sea limit in order to gain greater recognition of her established fishing rights in international waters. (Suisan Keizai Shimbun, December 18, 1964.)

Note: See Commercial Fisheries Review, October 1964 pp. 49 & 70.

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HIGH-SEAS FISHERY PROMOTION LAW PROPOSED:

The Japanese fishing industry has long felt the need for a law whereby the Government could assist the distant-water fisheries. Therefore, the industry plans to seek enact-

ment of such legislation. Industry leaders, led by the officers of the Japan Fisheries Society and the President of a large fishery firm, are drafting a bill for the promotion of high-seas fisheries. The bill calls for the extension of government assistance to the distant-water fisheries, including the tuna, salmon, crab, bottom-trawl, and whale fisheries. The bill also spells out administrative measures on taxes, labor, and state subsidies. (Suisancho Nippo, January 14, 1965.)

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FISHING COMPANY OBTAINS LARGE LOAN:

Japan's largest fishing enterprise arranged to borrow US\$21 million during 1965 from a United States financial institution. The loan bears an interest rate of 5.5 percent per annum. In 1964, that firm obtained a short-term loan of US\$11.7 million from the same bank. (Japan Economic Journal, January 12, 1965.)

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FACTORYSHIP TO BUY POLLOCK FOR FISH MEAL FROM SOVIET FISHING VESSELS:

The Japanese factoryship Hoyo Maru (14,111 gross tons), formerly the Renshin Maru, was scheduled to depart Hakodate about January 25 for the Okhotsk Sea. Under an agreement concluded with the Soviet Union, the factoryship will buy from Soviet fishing vessels Alaska pollock for processing into meal. The agreement reportedly calls for the delivery of 30,000 metric tons of fish.

The Hoyo Maru was expected to remain on the fishing grounds for about 60 days, to the end of March 1965, and will initially operate in the vicinity of 52° N. latitude. Size of the Soviet fishing fleet that serviced the Japanese factoryship was not known, but Japanese sources believed that, on the basis of the quantity of fish contracted for delivery, about 30 vessels in the 150- to 300-ton class would be assigned to fish for the factoryship. (Suisan Keizai Shimbun, December 25, 1964, and January 9, 1965.)

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WHALE OIL AND MEAT PRODUCTION, 1963/64 SEASON:

Japan's production of whale products from the 1963/64 season's Antarctic and North Pacific whaling expeditions amounted to 334,905

Japan (Contd.):



Cutting up whales aboard a Japanese whaling factoryship.

Table 1 - Japanese Antarctic Production of Whale Products, 1963/64 Season

Product	Quantity	Estimated Value
	Metric Tons	US\$1,000
Baleen (4,600 blue-whale units):		
Oil	95,400	21,111
Frozen meat	144,400	40,111
Salted meat	6,200	1,033
Meal	3,800	581
Liver oil	55	153
Whale meat extract . .	132	513
Total	249,987	63,502
Sperm (4,700 whales):		
Oil	1/20,400	4,122
Salted meat	1,600	267
Meal	1,400	214
Liver oil	45	125
Whale meat extract . .	158	614
Total	23,603	5,342
Grand total	273,590	68,844

1/Includes inventory carryover from previous season of 3,300 tons.

metric tons valued at an estimated US\$83 million. The Antarctic operation produced 81 percent of the total quantity and 83 percent of the total value.

The major part of the 1963/64 season yield consisted of whale meat and oil. Those two products accounted for 329,200 metric tons

Table 2 - Japanese North Pacific Production of Whale Products, 1963/64 Season

Product	Quantity	Estimated Value
	Metric Tons	US\$1,000
Baleen (800 blue-whale units):		
Oil	11,700	2,535
Frozen meat	25,800	7,167
Salted meat	300	50
Liver oil	26	72
Whale meat extract . .	13	58
Total	37,839	9,882
Sperm (2,460 whales):		
Oil	19,500	3,354
Frozen meat	2,100	350
Salted meat	1,800	300
Liver oil	45	125
Whole meat extract . .	31	138
Total	23,476	4,267
Grand total	61,315	14,149

or 98 percent of total production, of which whale meat totaled 182,200 tons and oil 147,000 tons. The value of those two items was \$49.3 million and \$31.1 million, respectively; they accounted for 59.3 percent and 37.5 percent of the total income received from the manufacture of whale products. (Fisheries Attache, United States Embassy, Tokyo, December 22, 1964.)

Note: See *Commercial Fisheries Review*, March 1964 p 61.

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GOVERNMENT'S FISHERY BUDGET ESTIMATES, FISCAL YEAR 1965:

The Japanese Government's fishery budget estimates for Fiscal Year 1965 (April 1965-March 1966) to be presented to the Diet for approval total 20,190 million yen (US\$56.1 million), 9 percent more than the Fiscal Year 1964 budget of 18,600 million yen (\$51.7 million). The Fiscal Year 1963 regular fishery budget was 15,166 million yen (\$42.1 million). In line with the stringent fiscal policy laid down for 1965 by the Finance Ministry, very few new programs were added to the fishery budget as compared with previous years.

Funds for Some of the Proposed Fiscal Year 1965 Programs with Comparisons

Program	Proposed			
	FY 1965 Budget		FY 1964 Budget	
	Yen	US\$	Yen	US\$
	(In 1,000's)			
Water pollution control measures	1,612	4.5	-	-
Countermeasures for international fisheries	22,835	63.4	22,357	62.1
Guidance, supervision, and control of northern water fisheries	191,895	533.0	195,146	542.1
Guidance, supervision, and control of distant water fisheries	173,693	482.5	172,625	497.5
Promotion and development of overseas fisheries	24,373	67.7	4,624	12.8
Development of new fishing grounds	19,373	53.8	-	-
Improvement of fishing vessel management	11,120	30.9	9,946	27.6
Biological research related to international fisheries	148,458	412.4	137,756	382.7

Japan (Contd.):

The proposed fiscal year 1965 Japanese fishery budget includes the sum of \$67,700 for the promotion and development of overseas fisheries, 5 times more than the previous year's allotment. It also includes \$53,800 for a new program named "Development of New Fishing Grounds." Funds for the establishment of a fishery data center were disapproved by the Finance Ministry. (Suisan Keizai Shimbun, January 5, 1965.)



Netherlands

GOVERNMENT GIVES FISHING INDUSTRY FINANCIAL SUPPORT:

General details of the Netherlands Government budget of Fl. 2 million (US\$554,000) for improvement of that country's fishing industry were announced by the Minister of Agriculture and Fisheries early in January 1965. Of the total, \$277,000 is planned for the improvement in quality standards for fresh herring and mackerel; \$125,000 for withdrawal of about 30 drift-net loggers from the fleet; \$110,000 for support of experimental fishing trips; \$28,000 for improving the fish canning industry; and \$14,000 for rationalization of commercial fresh-water fishing in Friesland.

Quality Standards: A premium of Fl. 3 (85 U.S. cents) a case of 25 kilograms (55 pounds) will be paid for first-quality fresh herring and mackerel landed in unused barrels at IJmuiden and Scheveningen. The purpose of the premium is to improve the competitive position of Dutch herring and mackerel in the German market, particularly in competition with Danish fish.

Experimental Fishing Trips: Subsidies will be paid for fishing trips to nontraditional fishing grounds for catches of different species (particularly cod, haddock, and ocean perch as opposed to flat fish), and for use of new fishing methods and vessel types. The subsidy will be paid only if the "experiment" helps to improve the structure of the Dutch fishing industry; a special commission will make this determination. The subsidy is designed in part to entice Dutch fishermen away from the overfished North Sea grounds and to encourage diversification in the catch. It will compensate for any losses incurred in searching for new fishing grounds.

Vessel Replacement: During the 1964 season, 45 drift-net loggers were active, none of which was built later than 1930 and some of which are more than 60 years old. If at least 25 of those vessels are offered for replacement before April 1, 1965, a replacement subsidy of Fl. 15,000 (\$4,150) per vessel will be paid. It was expected that about 30 of them would be offered.

Fish Canning: The subsidy will be used primarily to support the establishment of long-term delivery contracts to fish canneries. Steady supplies of fish to the canneries will, in the Government's opinion, result in more stable prices and better quality. The possibility of assistance in replacing machinery and equipment will also be investigated. It is hoped that the measures will assist in making Dutch canned fish more competitive in the European market.

Friesland Fresh-Water Fisheries: A fund will be established to buy up marginal commercial fresh-water fishing enterprises. The fund will be supplemented by the income earned from leasing the concessions held by such firms to sport fishermen.

With the exception of the Fl. 50,000 (\$14,000) earmarked for fresh-water fishing in Friesland, the subsidies will assist in improving the competitive position of the Dutch fishing industry in relation to its European Economic Community (EEC) counterparts, in anticipation of a common EEC fisheries policy. (United States Embassy, The Hague, January 7, 1965.)

Note: Fl. 3.614 equals US\$1.00.



Norway

EXPORTS OF CANNED FISH, JANUARY 1-SEPTEMBER 26, 1964:

Norway's total exports of canned fish during January 1-September 26, 1964, were up about 6 percent from those in the same period of 1963, due mainly to larger shipments of canned brisling and canned soft herring roe.

The packing of sild sardines in 1964 started in early May and by October 17, 1964, a total of 459,848 standard cases of small sild was packed, compared with 500,009 standard cases in the same period of 1963. Most of that pack was smoked sild. Unsmoked sild

Norway (Contd.):

accounted for only 41,212 cases of the 1964 pack and 42,543 cases of the 1963 pack.

Norwegian Exports of Canned Fish		
Product	Jan. 1- Sept. 26	
	1/1964	1963
	... (Metric Tons) ...	
Brisling	4,956	3,782
Small sild	9,747	10,289
Kippered herring	2,450	2,318
Soft herring roe	1,073	621
Sild delicatessen	327	321
Shellfish	1,246	1,147
Other fishery products	2,282	2,410
Total	22,081	20,888
1/Preliminary.		

The pack of brisling from the start of the season in late May to October 17, 1964, amounted to 362,081 standard cases, compared with 272,687 standard cases in the same period of 1963. The 1964 Norwegian brisling fishing season appeared to be drawing to a close in October 1964.

Mackerel landings in 1964 for canning purposes totaled 1,236 tons as of October 10, 1964, compared with 1,365 tons in the same period of 1963. (Norwegian Cannery Export Journal, November 1964.)

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WHALE OIL STOCKS SOLD OUT:

Norwegian stocks of whale oil from the 1963/64 season production have been completely sold out, according to a report in the Norwegian newspaper, Norges Handels og Sjøfartstidende, December 16, 1964. A total of 46,000 long tons of 1963/64 Norwegian whale oil production was sold at £83.5 (US\$233.8) per long ton. The newspaper predicted an increase in the price of whale oil since Norwegian stocks are exhausted. Whale oil, unlike competing oils, does not deteriorate when stockpiled. (United States Embassy, Oslo, December 22, 1964.)

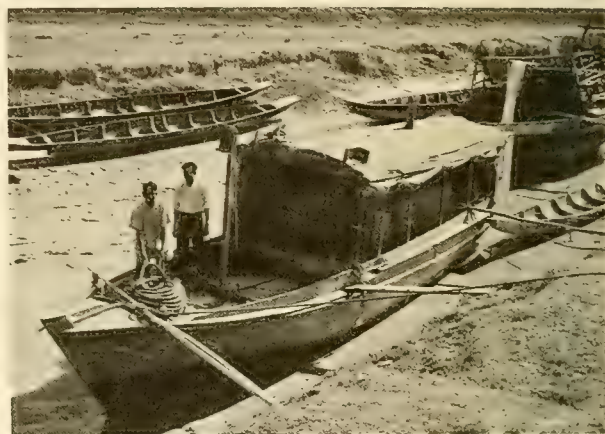


Pakistan

FISHERY PRODUCTS EXPORTS,
FISCAL YEAR 1963/64:

Pakistan's export value of fishery products in fiscal year 1963/64 increased to about US\$20.8 million as compared with \$6.6 mil-

lion in fiscal year 1958/59, according to a Pakistan Government press release. The value of exports for the current year is expected to be about the same as in the previous year. The export value of fishery products is expected to rise to \$41.6 million by 1969/70, according to the estimate given in the outline of Pakistan's Third Five-Year Plan.



A modernized fishing vessel powered by a 30 b. hp. engine operating out of an East Pakistan port.

That country's total landings of fresh-water and marine fish in 1962/63 was 329,000 metric tons. The Third Five-Year Plan target is landings of 473,000 tons. If measures proposed to develop Pakistan's marine fishing industry are properly implemented it is estimated that about 25 percent of the target production will be exported. (United States Embassy, Karachi, January 1, 1965.)



Papua-New Guinea

FISHERIES POTENTIAL OF
PAPUA AND NEW GUINEA:

The Australian-administered Territories of Papua and New Guinea are believed to have fishery resources which might support a canning industry. Those territories comprise the Australian Territory of Papua, and the United Nations Trust Territory of New Guinea which includes New Britain, New Ireland, Manus, Bougainville and Buka in the Solomons, and about 600 lesser islands. It is expected that a survey by the World Bank will recommend faster economic development for Papua and New Guinea. (Pacific Islands Monthly, November 1964.)

Persian Gulf

ANGLO-ARABIAN SHRIMP FISHING VENTURE IN PERSIAN GULF:

Since September 1964, a British firm has cooperated with interests in Beirut, Lebanon, to develop a shrimp fishing operation in the Persian Gulf.

The first trawler to be used in the new venture--a 95-foot (b.p.) side trawler with blast-freezing equipment purchased from Italian owners--has operated since late 1964. Results are promising.

A second vessel--a stern trawler purchased from Denmark--was sent to the Persian Gulf in early 1965 to expand the operation. The new stern trawler is larger than the first vessel and may serve as mothership to a number of small shrimp boats as well as engage in fishing itself.

The vessels will operate together and their catches--mainly shrimp--will be shipped to the United States on refrigerated freighters. (Ross Group, Grimsby, England, January 15, 1965.)

Note: See Commercial Fisheries Review, December 1964 p. 109.



Portugal

CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1964:

Portugal's total exports of canned fish in oil or sauce during the first 9 months of 1964 showed only a small increase over the same period of 1963. Sardines accounted for 78 percent of the total canned fish exports in January-September 1964.

Product	Jan.-Sept.			
	1964		1963	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines	37,149	1,955	33,924	1,785
Chinchards	2,612	137	1,341	71
Mackerel	3,478	139	4,504	180
Tuna & tuna-like . .	1,444	48	2,590	86
Anchovy fillets . . .	2,340	234	3,434	343
Others	529	27	258	14
Total	47,552	2,540	46,051	2,479

Portugal's principal canned fish buyers during the first 9 months of 1964 were Germany with 9,009 metric tons, the United Kingdom with 7,010 tons, Italy 4,873 tons, France

4,354 tons, the United States 4,195 tons, and Belgium-Luxembourg 2,980 tons. Germany's purchases of canned fish from Portugal in January-September 1964 increased 23 percent from those in the same period of 1963. Purchases by the United Kingdom were up 33 percent. But purchases by the United States and Italy in the first 9 months of 1964 were down 17 and 36 percent, respectively. (Conservas de Peixe, November 1964.)

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CANNED FISH PACK, JANUARY-SEPTEMBER 1964:

Portugal's total pack of canned fish in oil or sauce in the first 9 months of 1964 was up 28 percent from that in the same period in 1963. The increase was due to an expanded

Product	Jan.-Sept.			
	1964		1963	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
<u>In oil or sauce:</u>				
Sardines	34,177	1,799	19,818	1,043
Chinchards	1,356	71	2,315	123
Mackerel	3,375	135	5,414	216
Tuna & tunalike . . .	4,708	157	5,381	180
Anchovy fillets . . .	2,085	208	2,956	296
Others	534	28	347	18
Total	46,235	2,398	36,231	1,876

sardine pack. The pack of other leading Portuguese canned fish items was down in January-September 1964. (Conservas de Peixe, November 1964.)



South Africa Republic

ANCHOVY AND PILCHARD FISHERIES, AUGUST-SEPTEMBER 1964:

South Africa Republic: The new anchovy fishery of South Africa received its first large commercial test in August 1964 after the close of the Cape pilchard season. By the first week in September 1964, more than 40 Cape vessels were reported to be engaged in anchovy fishing. The Cape anchovy catch was 4,032 short tons in August 1964 and 21,342 tons in September 1964. Also taken in Cape anchovy nets during the 2 months was an incidental catch of 320 tons of pilchards and 116 tons of maasbanker. That brought the Cape shoal fish catch for January-September 1964 to 413,613 tons.

From the beginning of 1965, all vessels licensed to supply factories with pilchard, ma-

South Africa Republic (Contd.):

asbanker, and mackerel may also catch anchovy. That was announced by the Chairman of the South African Fisheries Development Corporation when he opened the Sea Harvest Festival at Lambert's Bay on October 31, 1964. He also stated that regulations for the anchovy fishery would be issued soon.

South-West Africa: Fishing vessels operating from Walvis Bay and Luderitz caught 108,965 tons of pilchards and 350 tons of anchovy during August 1964. In September 1964, as several factories closed down after completing their quotas, the catch dropped to 52,025 tons of pilchard and 176 tons of anchovy. At the end of September 1964, South-West African factories had received 661,047 tons of their 1964 quota of 720,000 tons.

At the end of September 1964, most factories in South-West Africa decided to postpone further anchovy fishing until the first part of 1965.

South and South-West Africa: Combined shoal fish catch for South Africa Republic and South-West Africa January-September 1964 amounted to 1,074,210 tons of maasbanker, pilchard, mackerel, and anchovy.

By the end of October the 1964 shoal fish catch of South and South-West Africa had passed the 1963 record total of 1,085,806 short tons and seemed likely to reach 1,150,000 tons. When that is added to the eventual catch of the trawling section of the industry and of spiny lobster and line fish, it is almost certain to raise the 1964 total for all commercial fishing to a new record for the seventh year in succession since 1958. (South African Shipping News and Fishing Industry Review, November 1964.)

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SHRIMP EXPLORATIONS OFF COAST:

South Africa has moved another stage closer toward starting a shrimp fishing industry with the discovery in 1964 of apparently highly productive grounds to the west of Cape Agulhas and off Natal. The discoveries were made in the course of exploratory trips initiated and carried out by the Fisheries Development Corporation (FDC) in cooperation with the South African trawling industry.

Early in 1964 the small experimental stern trawler Keurbooms was made available to the FDC by a local fishing company. Using this 67-foot long vessel, an FDC crew under the direction of a former senior fishing technologist with the Division of Sea Fisheries, began a wide-ranging probe that extended from Lambert's Bay round to north of Durban.

According to the general manager of the FDC, the Keurbooms has proved very suitable for such explorations and could well indicate the type of vessel which may in the future be used in shrimp fishing. Although a beam trawl had been tested, almost all fishing has been done with 75- and 100-foot otter trawls whose synthetic fiber netting has a small mesh ranging in size from 1½ inches stretched in the wings to ¾ inches stretched in the cod end.

The object of the explorations has been to investigate, try out, and pinpoint exploitable shrimp grounds. What has been achieved in a period of six months from February to August is described in a preliminary report issued in September 1964 by the FDC. The report notes that the investigation has led to the discovery of several shrimp grounds "which appear to be highly productive." The grounds are located off Durban (at depths between 200 and 230 fathoms), off the Tugela River mouth (at about 20 fathoms), and in the area between Cape Hangklip and Danger Point (at depths ranging from 85 to 90 fathoms).

Details given in the report of results from the five main areas covered are:

Area 1 (Lambert's Bay to Cape Point): The Keurbooms fished in those waters during February and March 1964, and achieved the best results between the latitudes of Saldanha Bay and Dassen Island. Catch details for the latter area are: gear used: 75-foot shrimp bottom trawl; depth range: 96-110 fathoms; total number of hauls: 32; total fishing time: 75 hours; total catch of shrimp: 205 pounds; best catch in a single haul: 16 pounds (in 2 hours); average catch an hour: 3 pounds; size of shrimp caught: 75-85 to the pound (heads on).

The species caught were Solenocera africanum (red prawn) and Chlorotocus crassiorinus (red shrimp), and they were mixed mainly with large numbers of small hake. Fishing was done at night; a haul made during daytime yielded virtually no shrimp.

Area 2 (Cape Point to Cape Agulhas): This area fished during April to June revealed considerable concentrations of shrimp in two areas, namely from Cape Hangklip towards Gansbaai, and south of Danger Point as follows:

CAPE HANGKLIP TO GANSBAAI: Gear used: 75-foot shrimp bottom trawl; depth range: 85-86 fathoms;

South Africa Republic (Contd.):

total number of hauls: 7; total fishing: 7 hours; total catch of shrimp: 135 pounds; best catch in a single haul: 48 pounds (in 1 hour); average catch an hour: 20 pounds; size of shrimp: 120-130 to the pound.

SOUTH OF DANGER POINT: Gear used: 75-foot and 100-foot shrimp bottom trawls; depth range: 85-90 fathoms; total number of hauls: 16; total fishing time: 16 hours total catch of shrimp: 565 pounds; best catch in a single haul: 50 pounds (in 1 hour); average catch an hour: 35 pounds; size range of shrimp caught: 100-110 to the pound.

The predominant species of shrimp caught were Solenocera africanum, and catches contained fair quantities of small hake. As the few hauls made during daytime yielded negligible quantities of shrimp, night fishing was adapted as a standard procedure.

Area 3 (Cape Agulhas to Plettenberg Bay): This area explored intermittently during April-June and yielded insignificant quantities of shrimp. The presence of large numbers of small Agulhas sole was a striking feature of the majority of the test catches made in the area.

Area 4 (Plettenberg Bay to Port Shepstone): This area explored intermittently during May and June, but bad weather hampered fishing, with the result that the catch data are rather sketchy. The isolated hauls made between Plettenberg Bay and Port Elizabeth yielded negligible amounts of shrimp, while the area extending from Port Elizabeth to Port Shepstone was not fished at all. Area 4 as a whole is rather poor in trawling grounds, but it is intended to investigate those grounds again when the opportunity arises.

Area 5 (Port Shepstone to Lourenco Marques): In that region, explored during July and early August, shrimp were found in abundance about 12 miles south-east of Durban and within 3 miles off the Tugela River mouth. The remainder of Area 5 yielded insignificant quantities of shrimp but this finding may be reversed by carrying out a more intensive survey, especially in the northern part of the area.

The catch details for the two productive grounds in Area 5 are as follows:

SOUTH-EAST OF DURBAN: Gear used: 100-foot shrimp bottom trawl; depth range: 200-230 fathoms; total number of hauls: 9; total fishing time: 9 hours; total catch of shrimp: 1,000 pounds; best catch in a single haul: 200 pounds (in 50 minutes); average catch an hour: 110 pounds. Size composition (by weight) of the average catch: "knife prawn" (about 25 a pound): 80 percent; "king prawn" (about 3 a pound): 16 percent; various small shrimp (about 150 a pound): 4 percent.

The two species of large shrimp caught (ranging from 3 to 25 to the pound) accounted for 96 percent of the catches. They were identified by the Division of Sea Fisheries as Hymenopenaeus triarthrus (knife prawn) and Nephrops andamanica (king prawn). The dominant species present among the small shrimp caught were Plesionika martia, Parapenaeopsis acclivirostris, and Solenocera comatum. The shrimp catches were often mixed with fair quantities of Natal spiny lobster. Catch results were equally good at night and during the day in the area.

OFF THE TUGELA RIVER MOUTH: Gear used: 75-foot and 100-foot shrimp bottom trawls; depth range:

14-21 fathoms; total number of hauls: 12; total fishing time: 12 hours; total catch of shrimp: 300 pounds; best catch in a single haul: 40 pounds (in 1 hour); average catch an hour: 25 pounds. Size composition (by weight) of the average catch: "brown shrimp" (about 15 a pound) and "tiger shrimp" (about 15 a pound) 73 percent; various small shrimp (about 150 a pound) 27 percent.

The Division of Sea Fisheries has identified the brown shrimp caught in the area as Penaeus indicus and the tiger shrimp as Penaeus monodon. They ran about 15 shrimp to the pound. The small shrimp caught were mainly of the same species as those found off Durban. The shrimp were mixed with fair quantities of small kob, and again there was no significant difference between catches made during daytime and those made at night.

The FDC report concluded that in view of the good results obtained, in particular off the Natal coast and on the western side of the Agulhas Bank, there seemed to be sufficient justification for intensifying explorations of the shrimp resources. The FDC intends to accelerate the survey in order to chart properly the boundaries of the fishing grounds and determine their seasonal yields, while at the same time trying to evolve the optimum fishing method and gear with an eye on commercial exploitation, but with due regard to the biological implications of fishing with small-mesh trawls. (The South African Shipping News and Fishing Industry Review, October 1964.)

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HARBORS BEING IMPROVED TO HELP FISHERIES EXPAND:

Harbor improvement is needed so that the fisheries of the South Africa Republic can expand. That was emphasized by the Chairman of the South African Fisheries Development Corporation when he opened the Sea Harvest Festival at Lambert's Bay on October 31, 1964.

Cape fishing vessels suffer serious inconvenience because of the crowded conditions at Table Bay Harbor. That affects fisheries expansion. Operators can't buy larger vessels until they are assured of adequate dock space. Development of a plan for harbor improvement at Table Bay is a priority project, according to the Chairman of the Fisheries Development Corporation. He said, however, that such work would be very expensive, and completion of a new fishing harbor at Table Bay could not be expected in less than 3 years.

The Chairman summarized plans for harbor improvement at other South African ports. He said work on the expansion of harbors at Hout Bay and Gansbaai would probably begin in 1965 and should be completed in 3 years. A portion of Saldanha Bay will be developed for the fishing industry. Government engineers proposed plans for improvements at St. Helena Bay,

South Africa Republic (Contd.):

where better shelter for fishing vessels is urgently needed. A special committee is studying the prospects for improving the facilities for fishing vessels and fish processing at Mossel Bay. Improvements at numerous other places along the long South African coastline were also considered. (South African Shipping News and Fishing Industry Review, November 1964.)



South-West Africa

NEW SPINY LOBSTER GROUNDS EXPLORED OFF COAST:

A group of Windhoek (South-West Africa) businessmen has been granted a concession by the South-West Africa Administration to carry out research work into the spiny lobster potential in the area south of Cape Cross (about 100 miles north of Walvis Bay) to a point just south of Walvis Bay.

The fishing vessel Dalkeith started exploratory work in November 1964 which was expected to take several months. It is understood that if the exploration proves successful the company will be granted a concession to catch and process spiny lobster from that area.

An area between the Hoanib and Kunene Rivers along the extreme north coast of South-West Africa also was visited by the manager of a Walvis Bay fishing firm and the Fisheries officer of the South-West African Administration to investigate possible spiny lobster fishing grounds. Indications there of a very rocky shoreline and discarded spiny lobster shells on the beach led to the belief that the area seemed very promising.

The Walvis Bay fishing firm has a concession to fish for spiny lobster along that stretch of the coast. (The South African Shipping News and Fishing Industry Review, November 1964.)

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NEW FISHING FIRM PLANS PURCHASE OF FREEZER-STERN TRAWLERS:

A new company is to be formed in South-West Africa to fish for whitefish or bottom-fish in waters which have been worked almost exclusively by the Soviet fishing fleet.

The company plans to acquire three deep-sea freezer-stern trawlers which will be stationed at Walvis Bay. The share capital of the new company will be about US\$415,000 with 200,000 shares to be made available to the public at 50 South African cents per share.

The trawlers were to be ordered as soon as legal formalities were completed and suitable land acquired at Walvis Bay for the erection of a factory. (The South African Shipping News and Fishing Industry Review, November 1964.)



Spain

FISHERY TRENDS AT VIGO, OCTOBER-DECEMBER 1964:

Landings and Prices: Fishery Landings at the port of Vigo, Spain, in October-December 1964 totaled 26,619 metric tons valued at 251.5 million pesetas (US\$4.2 million), an increase of 14.0 percent in quantity but a decrease of 17.6 percent from the third quarter 1964 landings. Compared with October-December 1963, landings in the last quarter of 1964 were up 29.2 percent in quantity, but the value was down 6.3 percent.



Sardine landings were heavy during the last quarter of 1964--more than three times greater than in the last quarter of 1963. In October 1964, sardine landings for that month alone amounted to 7,000 tons. The lower value in the last quarter of the year was probably due to the larger proportion of lower-priced species in the total landings.

Total landings of 23,359 tons in July-September 1964 also included 2,548 tons of tuna (yellowfin), with an ex-vessel price of 27.18 pesetas a kilo (20.6 cents a pound).

Total landings in 1964 were lower by 8.1 percent in quantity and 20.8 percent in value

Spain (Contd.):

Table 1 - Landings and Average Ex-Vessel Prices of Selected Species at Vigo, October-December 1964 with Comparisons									
Species	1964						1963		
	October-December			July-September			October-December		
	Quantity	Avg. Price		Quantity	Avg. Price		Quantity	Avg. Price	
	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.	Metric Tons	Pesetas/Kilo	US\$/Lb.
Sardines . . .	10,442	5.27	4.0	2,021	6.61	5.0	3,359	8.09	6.1
Horse mackerel	3,239	5.03	3.8	4,806	2.21	1.7	3,034	4.14	3.1
Small hake . .	1,946	31.12	23.5	2,085	38.43	29.1	4,675	25.50	19.3
Octopus . . .	1,126	6.51	4.9	1,509	5.55	4.2	357	7.41	5.6

Table 2 - Distribution of Fishery Landings at Vigo, October-December 1964 with Comparisons			
Period	Shipped Fresh to Domestic Markets	Canned	Other Distribution (Smoking, Drying, Fish Meal, etc.) and Local Consumption
	(Metric Tons)		
4th Quarter 1964	11,445	8,439	6,735
3rd Quarter 1964	10,884	6,140	6,335
4th Quarter 1963	12,020	5,364	3,215

as compared with 1963. Since 1963 was an all-time record year, the 1964 landings were considered to be very good.

Table 3 - Fishery Landings at Vigo, 1960-64			
Year	Quantity	Value	
	Metric Tons	1,000 Pesetas	US\$1,000
1964	84,425	999,673	16,667
1963	91,882	1,261,424	21,037
1962	79,344	890,449	14,850
1961	74,810	723,033	12,058
1960	65,457	660,645	11,018

During early 1965, a group representing Vigo fishery interests visited the United States to examine refrigerating machinery. The visit was believed to be in connection with plans to establish a fishing company with facilities to market frozen fish throughout Spain. If the program is carried out, it will be the second company of its type in Spain.

Canned Fish Industry: Mainly as a result of the abundance and low price of sardines in October 1964, the canning industry was more active than usual during the early part of the fourth quarter. This situation emphasized the need for greater cold-storage facilities. During the heavy landings in October, substantial quantities of sardines had to be used for fish meal and fertilizer, with considerable waste and loss in the value of the fish.

A slight uptrend in the quantity of canned fish exports was reported for the last quarter

of 1964, with a considerable increase in exports of canned fish to the United States.

Note: See *Commercial Fisheries Review*, December 1964 p. 113; March 1964 p. 68.



U.S.S.R.

TUNA FACTORYSHIPS BUILT IN JAPAN:

The third of the five tuna factoryships ordered from Japan by the Soviet Union was scheduled to be turned over to the Soviet Union on January 19, 1965. Called the *Iakie Luchi* (5,100 gross tons), the factoryship carries 6 portable vessels and a complement of 180 persons. (*Suisancho Nippo*, January 12, 1965.)

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CANNED KING CRAB MEAT PRODUCTION FROM SEA OF OKHOTSK, 1958-64:

Production by the Soviet Union of canned king crab meat from the Sea of Okhotsk in 1964 was estimated to be 9.1 million pounds, according to a Japanese Government report. Average annual production from 1958 to 1964 was about 9.2 million pounds, but with a peak production of 14.2 million pounds in 1960.

Data on Soviet canned king crab production from the Sea of Okhotsk was reported to Japan as per the Japanese-Soviet fishery agreement

U.S.S.R. Canned King Crab Meat Production from Sea of Okhotsk, 1958-64	
Year	Quantity
	Lbs.
1964	9,072,000
1963	8,731,200
1962	8,606,400
1961	7,790,400
1960	14,193,600
1959	7,795,200
1958	8,179,200

U.S.S.R. (Contd.):

under the Northwest Pacific Fisheries Convention between Japan and the U.S.S.R. (United States Embassy, Tokyo, January 12, 1965.)

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CANNED SALMON EXPORTS, 1963:

Soviet exports of canned salmon in 1963 totaled 188,300 cases, valued at 4,275,000 rubles (US\$4.7 million), as compared to 194,100 cases valued at 5,206,000 rubles (\$5.8 million) in 1962, according to data released by the Soviets.

Soviet Exports of Canned Salmon, 1962-63						
Principal Countries of Destination	1963			1962		
	Qty.	Value		Qty.	Value	
	1,000 Cases	1,000 Rubles	US\$ 1,000	1,000 Cases	1,000 Rubles	US\$ 1,000
Great Britain	135.5	3,181	3,531	92.5	2,615	2,903
Cuba	12.1	229	254	29.5	711	789
Italy	7.7	171	190	2.5	48	53
Czechoslovakia	7.0	183	203	11.3	349	387
Belgium	5.9	101	112	5.2	92	102
East Germany	3.5	74	82	30.4	913	1,013
New Zealand	3.5	67	74	0.4	23	26
Australia	3.2	93	103	1.2	86	95
Finland	0.8	44	49	8.7	186	206

Note: New ruble (1964 official rate)--US\$1.11.
Source: *Suisancho Nippo*, January 12, 1965.

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Source: *Suisancho Nippo*, January 12, 1965.

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SALMON HYBRID ANNOUNCED BY SOVIETS:

The development of a new salmon hybrid has been announced by the Soviet Union. The salmon hybrid was developed on the Pacific Coast at the Kalinin fish-breeding plant on



Fig. 1 - Salmon spawners migrating upstream are intercepted by trap at Kalinin fish-breeding plant.



Fig. 2 - Soviet hatchery workers at Kalinin fish-breeding plant remove salmon spawners from traps.



Fig. 3 - Soviet hatchery worker holds up salmon specimen taken from trap at Kalinin.

Sakhalin Island, according to the Soviet newspaper *Tass*. (Editor's Note: It is not clear what species of salmon were crossed to produce the hybrid. There are some indications

U.S.S.R. (Contd.):

that the cross involved chum and pink salmon, or salmon similar to those species.) The Soviets claim that the new hybrid salmon combines early maturity with good size. (The Fisherman, Vancouver, B.C., November 13, 1964.)

Note: See Commercial Fisheries Review, July 1964 p. 75, May 1964 p. 76.

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SOVIET TRAWLING ACTIVITIES OFF SOUTH AFRICA, OCTOBER 1964:

Summary: The following summary of Soviet trawling off the South Africa Republic appeared in the Walvis Bay (South-West Africa) Namib Times, October 9, 1964.

"The first Russian vessels appeared off South-West Africa in February 1961, and since then they have increased their fleet from 6 vessels to 26, of which some 23 are at present operating off the coast south of here. The fleet belongs to three Russian co-operatives--1 from the Baltic Ocean at Kaliningrad and 2 from the Black Sea (one at Odessa and the other at Poti).

They are catching mainly white fish (groundfish). The exact quantity they catch is not known, but it is estimated to be about 50,000 tons a year...

"The Russians use far superior equipment... Apart from the conventional echosounder they also have a horizontal scanner which can trace shoals of fish in an area of 3 to 4 miles round the vessel.

"The (Russian) trawlers have a freezing capacity for approximately 500 tons of fish which is transferred at sea (or in the bay here) to depot ships which ferry out provisions, oil, and water, and take the fish transferred from the trawlers back to Russia. Some of the fish is being sold to Ghana and the United Arab Republic.

"Calls at Walvis Bay are only to supplement oil, water, and provisions should a depot ship or tanker be late in arriving back in these waters with the main stores.

"A thorough and organized research program into the fish potential off this coast is being carried out at the same time.

"The (Russian) trawlers follow the fish between Luderitz and the Kunene River mouth. At this time of the year they usually go south of Walvis Bay."

Interview with Captain of Soviet Trawler: An interview with George Svanidze, Captain of the Soviet trawler Shota Rustaveli, was obtained by the editor of the Walvis Bay Namib Times. Following are excerpts from that interview as published in the Namib Times, October 9, 1964:

"Captain Svanidze said that he left his home port of Poti on the Black Sea on the 16th of February this year (1964). After experimental catches off Aden, down the east coast of Africa, off Madagascar, and the vicinity of Port Elizabeth he had finally reached Walvis Bay last month (September 1964) with 450 tons of fish...

To sum up the interview, Captain Svanidze said "that fishing off this coast was poor at the moment; that he would barely make his 800 tons and therefore sacrifice the bonus they got if they brought home more than a 1,000 tons; that his ship could process a maximum of 15 to 20 tons of fish a day; that each trawler undertook one trip a year which usually lasted from 4 to 6 months...; and that he very much doubted that there were even 30 Russian ships operating off this coast."

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FREEZER-TRAWLER "GOLFSTRIM" DELIVERED TO SOVIETS BY DANISH SHIPYARD:

The 2,570-ton freezer-trawler M/S Golfstrim was delivered to V/O Sudoimport, Moscow, by a Copenhagen shipyard, December 30, 1964. Launched January 16, 1964, the vessel



Freezer-trawler M/S Golfstrim--a refrigerator vessel that can also be used as a trawler.

U.S.S.R. (Contd.):

is the 6th in a series of 11 freezer-trawlers for the U.S.S.R. being built by the Danish shipyard to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and dead-weight tonnage 2,550 to 2,600 metric tons. The first vessel in the series was the M/S Skryplev launched May 10, 1962. Another series of 4 freezer-trawlers has been ordered by the Soviets from the Danish shipyard for delivery in 1966.

The M/S Golfstrim is powered by a 6-cylinder diesel engine developing 3,530 horsepower at 200 r.p.m. The vessel is designed to serve mainly as a refrigerator vessel, but it can also operate as a stern trawler. It is equipped with a large stern chute for trawling and also for hauling aboard catches of other vessels.

The propulsion machinery as well as the refrigerating plant of the vessel are located amidships, with large refrigerated cargo holds fore and aft. The entire superstructure is arranged amidships.

The rigging consists of two pairs of self-supporting derrick posts. The foremost pair is provided with a top mast, as well as a self-supporting combined signal and radar mast. The derricks (four 3-ton and two 7-ton) are served by four 3-ton and two 5-ton winches. The deck machinery also includes one anchor winch, two 3-ton warping winches, and one 15-ton trawl winch. All winches are electric-hydraulic. (Regional Fisheries Attache, United States Embassy, Copenhagen, January 6, 1965.)

Note: See Commercial Fisheries Review, March 1964 p. 70.



United Kingdom

NEW SEMIAUTOMATED STERN TRAWLER "ROSS DAINTY" LAUNCHED:

The Ross Dainty was launched January 19, 1965 at a shipyard in Selby, England. Scheduled for completion and delivery in April 1965, the vessel is the first of two additional "Daring" class semiautomated stern trawlers being built for a large British trawling firm.

Ross Daring and her sistership Ross Delight (both launched in 1963) pioneered semi-



Launching of the Ross Dainty.

automated stern trawling in the North Sea. Each of those vessels has a length overall of 99 feet, a range of about 30 days, and a fish-hold capacity for about 140,000 pounds of iced fish. Each is worked by a crew of five men including the skipper.

The Ross Dainty incorporates the basic design of the Ross Daring with improvements developed through extensive trials of the earlier vessel.

Note: See Commercial Fisheries Review, Dec. 1964 p. 115.

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BRITISH FIRM ORDERS TWO MORE SEMIAUTOMATED STERN TRAWLERS:

Sisterships to be named Ross Fame and Ross Fortune have been ordered from a shipyard in Selby, England, by the British firm which pioneered semiautomated trawling in the North Sea with the Ross Daring. Somewhat larger than Ross Daring, the new stern trawlers will extend automation to middle-distance fishing. Ross Fame and Ross Fortune will each operate with a 10-man crew. British middle-water vessels usually carry about 15 men. The new vessels will eventually have automatic gutting machines to handle their catch.

Specifications of the Ross Fame will be length between perpendiculars 120 feet, beam 30 feet, and molded depth 12½ feet. Fish-room capacity will be 8,500 cubic feet representing space for about 100 long tons of shelf fish. Power will be provided by an engine developing 950 b. hp. at 1,500 r.p.m.

Both Ross Fame and Ross Fortune will have a bridge in the true sense of the word,

United Kingdom (Contd.):

with a conventional winch well forward under the protection of the whaleback, hauling the gear under the bridge, a system adopted because of the size of the vessels. Covered gutting and washing rooms adjoining the bridge will receive the catch after it is sorted on deck.

When completed later this year, the new vessels will operate out of Grimsby.

Note: See Commercial Fisheries Review, Dec. 1964 p. 115.



Viet-Nam

FISHERY TRENDS, JULY-SEPTEMBER 1964:

Viet-Nam's commercial fishery landings were at their highest level in August 1964 when they totaled 18,241 metric tons. But marine fish landings in September were light because of typhoons and strong seas.

Fishery exports, particularly of frozen shrimp, rose substantially throughout the third quarter of 1964, with 32,300 pounds in



July, 59,000 pounds in August, and 92,000 pounds in September.


About 25 percent of Viet-Nam's fishing fleet of some 42,000 craft is now motorized, with the number of fishermen operating as of the end of 1964 jumping to about 205,000 from 187,000 at the end of 1963. (United States Embassy, Saigon, November 9, 1964.)




FAO ASKS TIGHT CONTROL OF PESTICIDES

As part of a general statement of policy concerning fish and pesticides (FAO Fisheries Technical Paper No. 45), the Food and Agriculture Organization of the United Nations recommended in part, that: "As a matter of general principle, all possible efforts should be made to ensure that in the use of pesticides either for agricultural purposes or public health purposes, there will be: (a) minimum loss to aquatic life; (b) minimum degradation of the aquatic environment with consequent loss or reduction of aquatic stocks; (c) minimum danger to human beings through the ingestion of fish or fish products containing pesticides."

Toward those ends, FAO said it would advise and promote close control of the manufacture, labeling, marketing, and application of pesticides. FAO will also recommend: (1) testing new pesticides for their effect on aquatic life; (2) using only those pesticides that dissipate quickly or break down in soils and do not have residual action; and (3) taking measures to retard the run-off of polluted soil into water courses. (SFI Bulletin, No. 159, February 1965.)



FEDERAL ACTIONS



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

CONSUMER PROTECTION STRESSED AT ANNUAL CONFERENCE:

The main purpose of the 8th Annual Educational Conference, sponsored jointly by the U. S. Food and Drug Administration (FDA) and the Food Law Institute, was to promote understanding of and voluntary compliance with the Federal pure food and drug law. The Conference, held on November 30, 1964, at Washington, D. C., was highlighted by the theme, "What Industry Needs from FDA for Better Compliance."

In his paper, "Cooperation in Promoting Voluntary Compliance," FDA Commissioner George P. Larrick said, "The 1964 theme--industry information, voluntary compliance, consumer education--represents three inter-related ways of increasing consumer protection on a voluntary basis. The success of this approach depends upon constructive relationships between industry, consumers, and FDA, based upon a knowledge of each other's needs, functions, and responsibilities." He added that the FDA Consumer Education Program is based on the premise that an informed consumer can, among other things, appraise more accurately products that they buy, and that scientific research and communication are FDA's major tools in promoting voluntary compliance.

Other papers given at the Conference by FDA officials included, "Regulations, An Aid to Voluntary Compliance," "Science Promotes Voluntary Compliance," and "An Ounce of Prevention." The latter paper concluded with, "...all of FDA's vast storehouse of information is available to all levels of consumers to enable them to buy and use foods, drugs, cosmetics, hazardous household substances, etc., safely and with confidence."

Note: See Commercial Fisheries Review, December 1964 p. 117.

Department of the Interior

NEW DIRECTOR AND DEPUTY DIRECTOR APPOINTED FOR BUREAU OF SPORT FISHERIES AND WILDLIFE:

John S. Gottschalk, a native of Indiana, was sworn in December 1, 1964, by Secretary of the Interior Stewart L. Udall as the new Director of the U. S. Bureau of Sport Fisheries and Wildlife.

Gottschalk succeeds Daniel H. Janzen, who has accepted an appointment to develop a program for preserving rare and endangered species of fish and wildlife.



N. O. Wood, Jr., Director of the Department of the Interior's Office of Management Operations, administering the oath of office to John S. Gottschalk, newly appointed Director of the Bureau of Sport Fisheries and Wildlife, as Secretary of the Interior Stewart L. Udall looks on. Congressman T. A. Thompson, Chairman of the Sub-Committee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries, is on the left.

The new director served as head of that Bureau's Region 5 office in Boston, Mass., from May 1959 until his new appointment. He joined the U. S. Fish and Wildlife Service in 1945 and has served in the Divisions of River Basin Studies and Federal Aid. He was also Chief of the Bureau's Division of Fisheries from November 1957 to May 1959.

Director Gottschalk was vice president of the Wildlife Society in 1955 and that year received an American Motors Conservation A-

ward--a national citation for outstanding service in conservation. He is immediate past president of the American Fisheries Society.

Abram V. Tunison, of Falls Church, Va., has been named deputy director of the U. S. Bureau of Sport Fisheries and Wildlife, the Department of the Interior announced January 12, 1965. He was formerly assistant director for Fisheries in that Bureau and later became associate director.

Tunison will share with Director John S. Gottschalk in developing and administering Federal programs to insure the conservation of the Nation's sport fish, wild birds, and mammals. Those programs encompass intensive research in fish and wildlife biology, including research in disease, parasites, nutrition, genetics, ecology, and pesticide-wildlife biochemistry. The bureau also operates a national system of fish hatcheries and wildlife refuges, acquires lands and water areas for waterfowl; administers cooperative programs for control of predatory animals and rodents to protect game, livestock, growing agricultural crops, range forage; and supervises grants-in-aid to States and Territories for wildlife and fisheries restoration.

Tunison received his bachelor of science and master's degrees at Cornell University where he majored in animal nutrition, and also studied for a doctoral degree. He is active in the American Fisheries Society, the American Society of Limnologists and Oceanographers, and the Wildlife Society.

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FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

CURRENT STATUS OF FISHERY RESOURCE DISASTER FUNDS:

To restore commercial fisheries in which there have been failures due to resource disasters arising from natural or undetermined causes, or to prevent similar failures in the future, \$400,000 was authorized to be used by the Secretary of the Interior under Section 4 (b) of Public Law 88-309, the Commercial Fisheries Research and Development Act of 1964.

On July 25, 1964, the Secretary of the Interior determined that a commercial fishery failure due to a resource disaster had occurred in the Great Lakes chub industry. This failure occurred in 1963 following a Food and Drug Administration warning of botulism in

smoked fish. The result was a drastic reduction in consumption of smoked fish. This led to substantial economic injury to Great Lakes fishermen and to processors and distributors of smoked fish from the Great Lakes area.

Following the Secretary's determination, Interior's Bureau of Commercial Fisheries met with state and industry representatives in the Great Lakes area. It was determined that diversion payments were necessary to remove from the usual markets the stocks of frozen chubs which were preventing normal trade operations. These chubs, even though frozen, had deteriorated to the point where they could be used only for reduction to fish meal or destroyed.

Letters of explanation and application forms were sent to 300 primary producers and processors of Great Lakes chubs throughout the United States. Eighty-five application forms were returned requesting diversion payments on about 1.7 million pounds of frozen chubs which were in storage prior to December 1, 1963, and which had not been sold or destroyed before May 20, 1964.

The responsibility for inspection and certification of stocks of chubs for diversion has been carried out under the general direction and supervision of the Regional Director, U. S. Bureau of Commercial Fisheries, Ann Arbor, Mich.

The first diversion payment was made on September 17, 1964, and by December 31, the termination date for the program, 51 inspection reports and claims for diversion payments had been received from smoked fish processors and producers in New York, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Massachusetts, New Jersey, and California. Payments totaling \$283,084.21 have been made for 1,621,874 pounds of chubs, which included 644,192 pounds of No. 1 (less than 320 fish per 100 pounds) and 977,682 pounds of No. 2 chubs (more than 320 fish per 100 pounds).

Prices paid to processors and primary producers were 21 cents and 7 cents per pound, respectively, for No. 1 and No. 2 fish. An additional 5 cents per pound was allowed in those instances where processing and related costs equalled or exceeded that amount.

Approximately 13 percent of the diverted chubs were destroyed and 87 percent were sold for reduction.

Section 4 (b) funds not used for diversion payments will be made available to Mid-western States under Section 253.4 (a) (4) of the regulations to carry out research and development projects directly related to the chub fishery. Project proposals received from the States of Minnesota, Wisconsin, and Michigan contemplate: (1) monitoring of smoked fish processing, distribution, and retailing; (2) educational activities involving sanitation practices, processing procedures, and handling techniques aimed at producing, processing, distribution, and retail levels; and (3) new product development.

Note: See Commercial Fisheries Review, December 1964 p. 117

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HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Ellingsen Fishing Corporation, Fairhaven, Mass., applied for a fishing vessel construction differential subsidy to aid in the construction of a 94-foot overall steel vessel to engage in the fishery for scallop, groundfish, flounder, lobster, and swordfish.

A hearing on the economic aspects of this application was scheduled for February 1, 1965, in Washington, D. C. The U. S. Bureau of Commercial Fisheries published the notice of hearing in the January 13, 1965, Federal Register.

Bethel, Inc., New Bedford, Mass., applied for a fishing vessel construction differential subsidy to aid in the construction of an 86-foot overall steel vessel to engage in the fishery for scallop, groundfish, lobster, and swordfish. A hearing on the economic aspects of the application was scheduled for February 19, 1965, in Washington, D. C.

Boat Commodore of N. B., Inc., New Bedford, Mass., applied for a fishing vessel construction differential subsidy to aid in the construction of an 86-foot overall wooden vessel to engage in the fishery for scallop, groundfish, flounder, and lobster. A hearing on the economic aspects of this application was scheduled for March 2, 1965, in Washington, D. C. Notice of hearings was published in the January 28, 1965, Federal Register for the two applications.

Einar Pedersen, Seattle, Wash., applied for a fishing vessel construction differential subsidy to aid in the construction of a 97-foot overall steel vessel to engage in the fisheries for

halibut, king crab, bottomfish, sablefish, and albacore tuna. The vessel might fillet and freeze fish at sea. (Notice of hearing was first published in the January 28, 1965, Federal Register.)

The application was amended to extend the fisheries in which the vessel might engage to herring, Pacific hake, Pacific shrimp, and Pacific scallops. As a result of the amendment, the hearing on the economic aspects of the application was postponed from February 25 to March 9, 1965. (The change was published in the February 9, 1965 Federal Register.)



Interstate Commerce Commission

TRUCK DETENTION CHARGES IN MIDDLE ATLANTIC TERRITORY PROPOSED:

All common carriers operating within the Middle Atlantic territory and between that and the New England territory will have to charge for detention of trucks by shippers and consignees if a recommended report of an Examiner of the Interstate Commerce Commission (ICC) is adopted after a second hearing is held.

The Examiner's report is the result of an investigation in Docket 33434, "Detention of Motor Vehicles--Middle Atlantic and New England Territory." It stems from a petition filed by the Middle Atlantic Conference, composed of approximately 1,300 motor common carriers, which asked the ICC to institute the investigation. Exceptions have been taken to the Examiner's report and will probably require a decision of Division II of the ICC.

The Examiner modified the Commission's previous decision and added a requirement that carriers enter into "reasonable prearranged schedules" for loading and unloading whenever requested by a shipper or consignee.

If adopted the rule will apply in the Middle Atlantic territory (except New York short-haul territory), and between the Middle Atlantic and New England territories. The rule will not apply on household goods, commodities transported in bulk in tank trucks and in dump trucks, articles transported by heavy haulers or picked up from or delivered to railroad cars, or to the transportation of palletized shipments to the extent such shipments are subject to another rule.

The ICC Examiner said that the principle of the proposed detention rule "is to discourage delays to carriers' vehicles, and not as a source of revenue; that it is obviously fair that the additional expense to a carrier caused by unreasonable delays of its vehicles should be borne by those legally responsible therefor, rather than by allocation to all customers in the carrier's general rate structure; that, other things being equal, one 'carrier' cannot effectively carry out the provisions of a detention rule when another 'carrier' has a competitive advantage of no detention rule; and that there is little hope for stability without the prescription of a uniform detention rule."

The rule as proposed follows:

DETENTION OF VEHICLES

This rule applies when carriers' vehicles ("vehicles" as used in this rule means straight trucks or tractor-trailer combinations, except that this rule will not apply to trailers without power units left by carrier at place of pickup or delivery of consignor, consignee, or other party) are detained at the premises of consignor, consignee, or other places of pickup or delivery subject to the following provisions:

SECTION I--GENERAL PROVISIONS

(a) This rule applies only to vehicles which have been ordered or used to transport shipments subject to truckload rates. If the shipment is moving on a rate subject to a stated minimum weight of 12,000 pounds or more, and such rate is not designated as a truckload rate, it will be considered a truckload rate for the purpose of applying this rule.

(b) This rule applies only when vehicles are detained by consignor, consignee, or others at the places of pickup or delivery and not when detention is the fault of the carrier.

(c) Free time for each vehicle will be as provided in Section III.

(d) After the expiration of free time as herein provided, charges as provided in Section IV will apply.

SECTION II--COMPUTATION OF TIME

(a) The time per vehicle shall begin to run upon notification by the driver to the responsible representative of the consignor, consignee, or other party at the place of pickup or delivery of the arrival of the vehicle for loading or unloading, as the case may be, either on the premises of the consignor, consignee, or other party at the place of pickup or delivery or as close thereto as conditions on said premises (or under the control of the consignor, consignee, or other party at the place of pickup or delivery) will permit, and shall end upon completion of loading or unloading and receipt by the driver of a signed bill of lading or receipt for delivery, as the case may be, except as provided in paragraph (b) of this section. Time, if any, necessary to prepare a vehicle for loading or unloading, as the case may be, will be excluded from the computation of time.

Exception--When carrier and consignor, consignee, or other party at place of pickup or delivery make a prearranged schedule for arrival of the vehicle for loading or unloading and carrier is unable for any reason to maintain such schedule within 30 minutes, the time shall begin to run from the commencement of loading or unloading and not from the time of arrival of the vehicle. If carrier's vehicle arrives prior to scheduled time, the time shall begin to run from the scheduled time or actual time loading or unloading commences, whichever is earlier.

Upon request of consignor, consignee, or other party at place of pickup or delivery, carrier shall enter into a reasonable prearranged schedule for arrival of the vehicle for loading or unloading.

(b) Computations of time are subject to, and are to be made within the normal business (shipping or receiving) day of the consignor, consignee, or other party at the place of pickup or delivery. When loading or unloading is not completed at the end of such day, time will be resumed at the beginning of the next such day. When loading or unloading carries through a normal meal period, meal time, not to exceed one hour, will be excluded from computation of time.

SECTION III--FREE TIME

Free time shall be as follows:

Column A		Column B	
Actual Weight in Pounds per Vehicle	Free Time in Minutes	Actual Weight in Pounds per Vehicle Stop	Free Time in Minutes per Vehicle Stop
Less than 24,000	240	Less than 10,000	90
24,000 and less than 36,000 . .	300	10,000 and less than 20,000 . .	180
36,000 or more	360	20,000 and less than 24,000 . .	240
		24,000 and less than 36,000 . .	300
		36,000 or more	360

Note: Column A - applies to vehicles containing truckload shipments requiring only one vehicle, or to fully loaded vehicles containing truckload shipments requiring more than one vehicle, except as provided in Column B.

Column B - applies to last vehicle used in transporting overflow truckload shipments requiring two or more vehicles, or to vehicles containing truckload shipments stopped for completion of loading or partial unloading.

SECTION IV--CHARGES

When the Delay per Vehicle Beyond Free Time is:	The Charge for Vehicle will be:
1 hour or less	\$10.00
Over 1 hour but not over 75 minutes . . .	12.50
Over 75 minutes but not over 90 minutes .	15.00
Over 90 minutes but not over 105 minutes	17.50
Over 105 minutes but not over 120 minutes	20.00
Over 120 minutes but not over 135 minutes	22.50
Over 135 minutes but not over 150 minutes	25.00
Over 150 minutes but not over 165 minutes	27.50
Over 165 minutes but not over 180 minutes	30.00
Over 180 minutes	1/
1/\$30.00 plus \$2.50 per each 15 minutes or fraction thereof over 180 minutes.	

SECTION V

A record of the following information must be maintained by the carriers and kept available at all times:

(a) Name and address of consignor, consignee, or other party at whose place of business freight is loaded or unloaded.

(b) Identification of vehicles tendered for loading or unloading.

(c) Date and time of notification of the arrival of the vehicle for loading or unloading.

(d) Date and time loading or unloading begins.

(e) Date and time loading or unloading is completed.

(f) Date and time vehicle is released for departure by consignor, consignee, or by other party at place of pickup or delivery after loading or unloading is completed.

(g) Total actual weight of shipment loaded or unloaded.

(h) Whether vehicles are tendered under a prearranged schedule for loading or unloading.

(i) When vehicles are tendered under a prearranged schedule for loading or unloading, date and time specified therefor.

SECTION VI

Nothing in this rule shall require a carrier to pick up or deliver freight at hours other than such carrier's normal business hours.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

REVISED WAGE ORDER PROGRAM FOR INDUSTRIES IN PUERTO RICO, VIRGIN ISLANDS, AND AMERICAN SAMOA ANNOUNCED:

A revision of the 1965 wage order program under the Fair Labor Standards Act for industries in Puerto Rico, the Virgin Islands, and American Samoa was announced December 16, 1964, by the U.S. Labor Department's Wage and Hour and Public Contracts Divisions.

An industry committee (No. AS-6) hearing to be held in July 1965 will review all industries in American Samoa. Tuna canneries there will be included in the hearings since the minimum wage for tuna canneries in American Samoa is less than the mainland minimum

wage. A committee hearing in November 1965 to consider all industries in the Virgin Islands was also added to the wage review schedule (Committee No. VI-9).

Food and related products in Puerto Rico does not include tuna canneries there because they are at present at the mainland minimum wage.

The Fair Labor Standards Act authorizes industry committees to recommend minimum wage rates for industries in Puerto Rico, the Virgin Islands, and American Samoa at or below the statutory minimums that apply on the mainland. Appointed by the Secretary of Labor, the committees are equally representative of employers, employees, and the public, and include residents of both the island involved and the mainland.



Eighty-Ninth Congress (First Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and

allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



ANADROMOUS FISH CONSERVATION: Introduced in House: H. R. 2399 (Cohelan) Jan. 12, 1965, H. R. 2634 (Miller) Jan. 13, H. R. 3798 (Hague of Calif.) Jan. 28, H. R. 3927 (Dingell) Feb. 1, to authorize the Secretary of the Interior to initiate with several States a cooperative program for the conservation, development, and enhancement of the Nation's anadromous fish, and for other purposes; to the committee on Merchant Marine and Fisheries; similar to other bills. Also in Senate, similar to H. R. 2399, S. 909 (Magnuson) Feb. 1; to Committee on Commerce. Sen. Magnuson in his remarks (Congressional Record, Feb. 1, p. 1693) in the Senate pointed out that some of the principal anadromous species are Atlantic salmon, striped bass or rockfish, alewives, sturgeon, five species of Pacific salmon, steelhead, American shad, and "sea run trout." Would authorize Secretary of the Interior to first, conduct investigations, engineering, and biological surveys and research where necessary; second, construct, install, maintain, and operate devices and structures for the improvement of feeding and spawning conditions and for facilitating free migration of anadromous fish; third,

construct, operate, and maintain fish hatcheries; and fourth, purchase, lease, or accept donations of lands and any interest therein. Would authorize cooperative agreements with Federal, State, public, or private agencies, or organizations and colleges and universities to conduct studies, research, and investigation. Would appropriate \$25 million for the 5-year life of the bill which would expire June 30, 1969. The Federal share, including the operation and maintenance of any facilities constructed, shall not exceed 50 percent of such costs exclusive of the value of any Federal land involved. Not to exceed 20 percent of all funds expended or obligated in any fiscal year may be expended in any one State. Would direct the Secretary of the Interior to make recommendations to the Secretary of Health, Education, and Welfare concerning the elimination or reduction of pollution when found to be detrimental to fish and wildlife in interstate waters or tributaries thereof. Also H. R. 4349 (Don H. Clausen) Feb. 4, similar to S. 909 except that Federal share shall not exceed 75 percent; would authorize \$5 million annually with no expiration date.

BUDGET: The Budget of the United States Government, fiscal year ending June 30, 1966, 89th Congress, 1st Session, House Document No. 15, Part 1, 512 pp., printed. Contains Budget Message of the President, summary tables and statistical information, and various special analyses.

Appendix, the Budget of the United States Government, fiscal year ending June 30, 1966, 89th Congress, 1st Session, House Document No. 16, 1263 pp., printed. Shows the text of the appropriation estimates with specific reference materials on the various appropriations and funds.

COASTAL FISHERY RESOURCES OF U. S.: Sen. Magnuson inserted in the Congressional Record, Feb. 10, 1965 (pp. 2506-2509) the address Sen. Bartlett made Jan. 26, 1965, before the National Cannery Association, San Francisco, titled "The Conservation of U. S. Coastal Fishery Resources." It emphasizes that the United States must take whatever action is required to conserve and protect the fishery resources upon which we depend.

COMMERCIAL FISHERY RESOURCES SURVEY: S. J. Res. 29 (Magnuson) introduced in Senate Jan. 19, 1965, joint resolution to authorize and direct the Bureau of Commercial Fisheries to conduct a survey of the marine and fresh-water commercial fishery resources of the United States, its territories, and possessions; to the Committee on Commerce. Sen. Magnuson's remarks (Congressional Record, Jan. 19, 1965, pp. 884-885) pointed out that it would authorize and direct the Bureau of Commercial Fisheries to conduct a survey of the character, extent and condition of the marine and fresh-water commercial fishery resources, both present and potential of the United States, its territories and possessions; the economic status and organization of the industry; the economic, legal and other institutional handicaps to industrial development and conservation of fishery resources; the effects thereon of existing conventions and treaties relating to the living marine resources of the high seas, and the nutritive and industry values of fishery products and byproducts affecting or potentially affecting the industry and its economy. (Similar to S. J. Res. 174 in 88th Congress, passed by Senate Aug. 19, 1964; referred to House Committee on Merchant Marine and Fisheries Aug. 20; no further action.)

EXPORT EXPANSION ACT OF 1965: S. 558 (Magnuson and 4 others) introduced in Senate Jan. 15, 1965, to Committee on Commerce; and H. R. 3028 (Adams) in-

troduced in House Jan. 18, 1965, to Committee on Interstate and Foreign Commerce; to authorize the Secretary of Commerce to carry out certain programs to develop and expand foreign markets for U. S. products, and to provide more effectively for assistance in financing of certain foreign sales which are affected with national interest. Purpose is to step up U. S. exports by establishing an export financing fund to finance exports to countries with special credit risks. Sen. Magnuson's remarks (Congressional Record, Jan. 15, 1965, pp. 711-714) pointed out that Title I of his bill will create three separate but interrelated trade development programs: (1) A Trade Development Corps, (2) a program of cooperative industrial export development; and (3) a program of assistance in the establishment of sales and service centers in lesser developed countries. Rep. Adams' remarks (Congressional Record, Jan. 18, 1965, p. 791) pointed out that his bill provides guarantees so that American private capital can be used to finance our private industrial exports to the emerging nations. It also provides for a trade development corps, and improved system for using impacted currencies, and new U. S. sales and service centers throughout the world. Rep. Adams (Congressional Record, Jan. 19, 1965, p. 923) corrected his remarks of Jan. 18, 1965, in the permanent Record with a substitute for the text of H. R. 3028 (Adams) introduced Jan. 18.

FISHERIES LOAN FUND EXTENSION: House Jan. 28, 1965, and Senate Jan. 29, 1965, received a letter from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation on extension of fisheries loan fund under the Fish and Wildlife Act of 1956; to Committee on Merchant Marine and Fisheries; and Committee on Interior and Insular Affairs, respectively.

H. R. 4227 (Bonner) introduced in House Feb. 3, 1965, to extend the term during which the Secretary of the Interior is authorized to make fisheries loans under the Fish and Wildlife Act of 1956, and for other purposes; to Committee on Merchant Marine and Fisheries. Would extend program from June 30, 1965, to June 30, 1975, and make certain technical changes; replace minimum annual interest rate with a formula for establishing the rate; provide annual payment to Treasury from fund of the interest on total loans outstanding at end of fiscal year.

Also S. 998 (Magnuson) introduced in Senate Feb. 4, 1965; to Committee on Commerce; similar to H. R. 4227. Sen. Magnuson in his remarks (Congressional Record, Feb. 4, 1965, pp. 1957-1958) inserted a letter from the Assistant Secretary of the Interior for Fish and Wildlife, requesting the proposed legislation, together with a statement relating to the bill. The letter pointed out that the objective of the program is to provide financial assistance to the commercial fishing industry for the purposes of upgrading or modernizing our fishing vessels and gear and thereby contributing to more efficient and profitable commercial fishing operations. The fund initially had an authorization of \$10 million, but this was increased in 1958 to \$20 million. A total of \$13 million has actually been appropriated to the fund. However, the fund will expire on June 30, 1965, unless extended. Bill would extend the fund to June 30, 1975, and also make technical changes in section 4 of the 1956 Act to make the program conform to the guidelines adopted by the President on Federal credit programs.

FISHERMEN'S ORGANIZATION AND COLLECTIVE BARGAINING: H. R. 3955 (Pelly) introduced in House Feb. 1, 1965, and S. 1054 (Magnuson and Bartlett) introduced in Senate Feb. 9, 1965, to make clear that fish-

ermen's organizations, regardless of their technical legal status, have a voice in the ex-vessel sale of fish or other aquatic products on which the livelihood of their members depends; to Committee on Merchant Marine and Fisheries and Committee on Commerce, respectively. Sen. Magnuson in his remarks (Congressional Record, Feb. 9, 1965, p. 2257) pointed out that the bill is designed to establish a sound economic relationship between fishermen, vessel owners, fish dealers and canners and thereby further the development of the U. S. fishing industry and interest of the consumer. (Similar to bills in 88th Congress; no action except Senate subcommittee hearings in 1963.)

FISH HATCHERIES: H. R. 4229 (Carter) introduced in House Feb. 3, 1965; Feb. 10: H. R. 4773 (Farnsley), H. R. 4811 (Stubblefield); to provide for the establishment of a new fish hatchery below but as near the Wolf Creek Dam, on the Cumberland River, near Jamestown, Ky., as is feasible and practicable; to Committee on Merchant Marine and Fisheries.

FISHING INDUSTRY: Senator Bartlett Jan. 29, 1965, had printed in the Congressional Record (pp. 1531-1532) the address ("The American Fishing Industry, 1964") by Donald L. McKernan, Director of the Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, at the 58th Annual Convention (Jan. 1965) of the National Cannery Association in San Francisco. The address summarizes the present status of the U. S. fishing industry.

FOOD MARKETING NATIONAL COMMISSION: Pursuant to the provisions of section 2, Public Law 88-354, the Speaker of the House announced that he had appointed Representatives Sullivan (Mo.), Purcell (Tex.), Rosenthal (N. Y.), Cunningham (Nebr.), May (Wash.) on the part of the House to membership on the National Commission on Food Marketing. Established to study and appraise the marketing structure of the food industry, the Commission is composed of 15 members--5 from the Senate, 5 from the House, and 5 appointed by the President from outside the Federal Government.

FOREIGN VESSELS' PROCESSING OF FISHERY PRODUCTS IN U. S. TERRITORIAL WATERS BANNED: H. R. 3954 (Pelly) introduced in House Feb. 1, 1965, to amend the act prohibiting fishing in the territorial waters of the United States by vessels other than vessels of the United States in order to expand the definition of the term "fisheries"; to Committee on Merchant Marine and Fisheries. Would prohibit freezing, packing, or other processing of fish or shellfish by foreign vessels in the territorial waters of the United States. (Similar to other bills in 88th Congress, no action.)

HALIBUT FISHING: Rep. Pelly in his extension of remarks (Congressional Record, Feb. 8, 1965, p. A509) inserted excerpts from a letter he received from the Secretary-Treasurer of the Deep Sea Fishermen's Union of the Pacific expressing the views of its membership in regard to the U. S. position on halibut fisheries in the north Pacific Ocean.

IMPORT COMPETITION ADJUSTMENT: H. R. 655 (Pucinski) introduced in House Jan. 4, 1965, to provide for adjusting conditions of competition between certain domestic industries and foreign industries with respect to the level of wages and the working conditions in the production of articles imported into the United States; to Committee on Ways and Means. (Similar to H. R. 1139, in 88th Congress; no action.)

INTERIOR DEPARTMENT: Assistant Secretary for Fish and Wildlife: Senator Metcalf in the Senate on Jan. 12, 1965, paid tribute to Frank P. Briggs, who is retiring as Assistant Secretary of Interior for Fish and Wildlife; that day's Congressional Record (p. 548).

Under Secretary: On Jan. 12, 1965, the Senate Committee on Interior and Insular Affairs favorably reported the nomination of John A. Carver, Jr., of Idaho, to be Under Secretary of the Interior. Prior to that action, the nominee testified and answered questions in his own behalf. On Jan. 15, Senate confirmed the nomination.

Interior Nomination: Hearing before the Committee on Interior and Insular Affairs, United States Senate, 89th Congress, 1st Session, on the nomination of John A. Carver, Jr., of Idaho, to be Under Secretary of the Interior, Jan. 12, 1965, 24 pp., printed. Includes a statement from the nominee, statements of several Senators, biological sketch, and pertinent editorials from several newspapers.

INTERIOR DEPARTMENT APPROPRIATIONS, FY 1966: Appropriations for the Department of the Interior and related agencies for fiscal year 1965 as contained in the President's Budget submission to Congress. Includes funds for the Fish and Wildlife Service and its two bureaus--Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife. The Bureau of Commercial Fisheries is proposed for \$30,597,000, an increase over the previous year. Of interest is a \$2 million request for a new program: "Federal Aid for Commercial Fisheries Research and Development," authorized by a new Act. Those funds will be apportioned among the states, Puerto Rico, American Samoa, the Virgin Islands, and Guam on a matching basis of up to 75 percent Federal funding.

Fish and Wildlife Service Annual Appropriations for Fiscal Year 1965 and for Fiscal Year 1966		
Item	1965 Adjusted Appropriation	Fiscal Year 1966 Est.
	... (\$1,000) ...	
FISH AND WILDLIFE SERVICE:		
OFFICE OF THE COMMISSIONER:		
Salaries and Expenses	\$ 444	\$ 444
BUREAU OF COMMERCIAL FISHERIES:		
Mgt. & invest. of resources	21,227	21,218
(Foreign Currency Program)	300	300
Construction	4,938	1,405
Construction of fishing vessels	2,500	5,000
General administrative expenses	704	674
Fed. aid for comm. fish research and develop.	-	2,000
Total Bureau of Commercial Fisheries	29,669	30,597
BUREAU OF SPORT FISHERIES & WILDLIFE:		
Total	52,809	46,885
Note: Permanent appropriations and special funds not included.		

House Speaker Feb. 9, 1965, presented a memorial of the Legislature of the State of Washington memorializing the President and the Congress of the United States to consider legislations for restoration of funds in the Department of the Interior's budget for the Columbia River Fishery Development program; referred to Committee on Appropriations.

INTERNATIONAL FISHERY PROBLEMS: Senator Bartlett Jan. 28, 1965, had printed in the Congressional

Record (pp. 1461-1463) the address ("Some U. S. International Fishery Problems and International Rules Dealing with Fisheries") by William C. Herrington, Special Assistant for Fisheries and Wildlife, at the 58th Annual (Jan. 26, 1965) Convention of the National Canners Association in San Francisco. The address presents different aspects of U. S. involvement in the international fisheries.

MARINE EXPLORATION AND DEVELOPMENT ACT: S. 1091 (Bartlett and 4 others) introduced in Senate Feb. 10, 1965, to provide a program of marine exploration and development of the resources of the Continental Shelf; to Committee on Commerce. Sen. Bartlett in his remarks (Congressional Record, Feb. 10, 1965, pp. 2477-2479) pointed out that this bill would establish and announce U. S. policy to undertake and accelerate a program of exploration and economic development of the physical, chemical, geological, and biological resources of the Continental Shelf. For executing this program the legislation would establish a Marine Exploration and Development Commission composed of five members--two members to be appointed by the President from private life, the Secretary of Commerce, Secretary of the Interior, and Secretary of Defense. The first function of the Commission would be to formulate and execute a program of exploration and development of marine resources of the Continental Shelf. More specifically, this would include the identification, location and economic development of mineral and biological resources of the Continental Shelf, the development of an engineering capability that will permit the exploration and development of these resources and the encouragement of marine exploration and development by scientific institutions and industries through the use of grants, loans and other cost-sharing arrangements. A marine exploration and development fund would be established. In addition to that fund, the legislation authorizes an annual appropriation not to exceed \$50 million to enable the Commission to carry out its own programing and operational functions under the act. This proposed legislation is directed at the development of all resources on and above the Continental Shelf, including fishery resources.

METRIC SYSTEM STUDY: H. R. 1154 (Roosevelt) introduced in House Jan. 4, 1965, to provide that the Secretary of Commerce shall conduct a study to determine the practicability and desirability of the adoption by the United States of the metric system of weights and measures; to Committee on Science and Astronautics. Similar to H. R. 301. Also similar bill S. 774 (Pell) introduced Jan. 27 in Senate; to Committee on Commerce.

MINIMUM WAGE: H. R. 1022 (Gilbert) and H. R. 1150 (Roosevelt) introduced in House Jan. 4, 1965, to amend the Fair Labor Standards Act of 1938 to increase the minimum wage to \$2 an hour; to Committee on Education and Labor. These bills are similar except that H. R. 1150 provides increases in steps from \$1.50 during the first year, \$1.75 during the second year, and \$2.00 thereafter with certain special provisions for Puerto Rico, Virgin Islands, and American Samoa.

NATIONAL FISHERIES CENTER AND AQUARIUM ADVISORY BOARD: Pursuant to the provisions of section 5 (a), Public Law 87-758, the Speaker of the House appointed Representatives Kirwan (Ohio) and Edwards (Ala.) to membership on the National Fisheries Center and Aquarium Advisory Board.

OCEANOGRAPHY: Introduced in House Jan. 11, 1965, H. R. 2218 (Lennon), Jan. 21 H. R. 3310 (Pelly), Jan.

25 H. R. 3352 (Bonner), to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; to Committee on Merchant Marine and Fisheries. (Similar to other bills in 88th Congress, especially H. R. 6997 passed by House Aug. 5, 1963, and referred to Senate Committee on Commerce Aug. 6, 1963; no further action.)

Hon. Santiago Polanco-Abreu, Resident Commissioner from Puerto Rico, in extension of remarks (Congressional Record, Jan. 28, 1965, pp. A352-353) stated that the ocean survey ship Explorer of the Coast and Geodetic Survey, U. S. Department of Commerce, was to sail Feb. 2, 1965, to conduct extensive hydrographic and oceanographic surveys in the Caribbean on a voyage which is expected to last for 4 months. Included is a description of the Explorer's mission.

OCEANOGRAPHIC COUNCIL: S. 944 (Magnuson and 12 others) introduced in Senate Feb. 2, 1965, to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes; to Committee on Commerce. Sen. Magnuson in his remarks (Congressional Record, Feb. 2, 1965, pp. 1754-1757) pointed out that the bill had two major legislative objectives. One is to set forth a policy and purpose for our national oceanographic program. The other is to provide high level guidance and coordination of Government activities under this program.

OCEANOGRAPHIC RESEARCH VESSEL INSPECTION: S. 627 (Magnuson) introduced in Senate Jan. 19, 1965, to exempt oceanographic research vessels from the application of certain vessel inspection laws, and for other purposes; to the Committee on Commerce. Also H. R. 3419 (Hanna) introduced in House Jan. 25, 1965; to Committee on Merchant Marine and Fisheries. Senator Magnuson's remarks (Congressional Record, Jan. 19, 1965, pp. 883-884) pointed out that the purpose of the proposed legislation is to encourage and facilitate oceanographic research by removing certain impediments which have been handicapping research vessel operation by both oceanographic institutions and private industry. (Similar to S. 2552 in 88th Congress; passed by Senate Aug. 1, 1964; referred to House Committee on Merchant Marine and Fisheries Aug. 3; no further action.)

OUTER CONTINENTAL SHELF RESTRICTED AREAS: Senate Jan. 12, 1965, received letter from the Secretary of the Navy, transmitting a draft of proposed legislation to provide for the restriction of certain areas in the Outer Continental Shelf, known as the Corpus Christi offshore warning area, for defense purposes, and for other purposes (with accompanying papers); to the Committee on Interior and Insular Affairs.

Introduced in Senate, Jan. 12, 1965, certain bills to provide for the restriction of certain areas in the Outer Shelf for defense purposes: (1) S. 426 the Eastern Test Range, (2) S. 427 Gulf Test Range, Gulf of Mexico, (3) S. 428 Matagorda Water Range; and for other purposes (with accompanying papers); to the Committee on Interior and Insular Affairs. Sen. Jackson in his remarks in that day's Congressional Record (p. 515) on the bills said, in part, that each provides for the restriction of certain areas of the submerged lands of the Outer Continental Shelf off the coasts of Florida and Texas for Defense Department and National Aeronautics and Space Administration purposes.

S. 645 (Jackson) introduced in Senate Jan. 22, 1965, to provide for the restriction of certain areas in the Outer Continental Shelf, known as the Corpus Christi off-

shore warning area, for defense purposes, and for other purposes; to Committee on Interior and Insular Affairs. Rep. Jackson's remarks (Congressional Record, p. 1003) pointed out that it would restrict the use of certain lands and waters (some 3.8 million acres) of the Outer Continental Shelf adjacent to the State of Texas and the operation of mineral leasing laws therein. Use by the Naval Air Advanced Training Command at Corpus Christi will be about 80 percent of the available daylight hours for the foreseeable future. Also introduced in House H. R. 2261 (Aspinall) Jan. 11, 1965, to provide for the Eastern Test Range; H. R. 2659 Jan. 13, 1965, to provide for the Gulf Test Range, Gulf of Mexico; both to Committee on Interior and Insular Affairs; similar to other Senate bills.

S. 999 (Jackson) introduced in Senate Feb. 4, 1965, to amend the act of Feb. 28, 1958, relating to the withdrawal, reservation, or restriction of public lands, and for other purposes; to Committee on Interior and Insular Affairs. Sen. Jackson in his remarks (Congressional Record, Feb. 4, 1965, pp. 1958-1959) inserted text of the bill and accompanying letter from the General Counsel of the Department of Defense. The letter stated the bill would, with respect to the most urgently needed shelf areas, replace the existing requirement for an act of Congress with a procedure under which the Committees on Interior and Insular Affairs would be notified in advance of any proposed restriction. But the present proposal would continue to make applicable the requirement for enabling legislation to shelf areas which are to be used for bombing, missile launching, or other activities which might make the areas unsafe for non-military use.

PACIFIC SOUTHWEST WATER RESOURCES: Introduced in House Jan. 11, 1965: H. R. 2264 (Hosmer); Jan. 13, H. R. 2618 (Lipscomb), H. R. 2661 (Teague of Calif.), H. R. 2663 (Wilson); Jan. 6, H. R. 1740 (Teague of Calif.); Jan. 19, H. R. 3176 (Smith of Calif.); to authorize the coordinated development of the water resources of the Pacific Southwest, and for other purposes; to the Committee on Interior and Insular Affairs.

PASSAMAQUODDY TIDAL POWER PROJECT: H. R. 2615 (Hathaway) and H. R. 2662 (Tupper) introduced in House Jan. 13, 1965, to Committee on Foreign Affairs; and S. 515 (Muskie and 7 others) introduced in Senate Jan. 15, 1965, to Committee on Public Works; to authorize the international Passamaquoddy tidal power project, including hydroelectric power development of the upper St. John River, and for other purposes. Congressman Hathaway's remarks (Congressional Record, Jan. 13, 1965, p. 626) pointed out that this project would harness the tides of Passamaquoddy and Cobscook Bays in Maine and New Brunswick and would develop the resources of the upper St. John River to the advantage of Maine, New England, and the Maritime Provinces of Canada. (These bills are similar to H. R. 10179 and other bills in 88th Congress; no action.)

PESTICIDES AND FISH AND WILDLIFE: H. R. 4157 (Dingell) introduced in House Feb. 2, 1965, to amend the act of August 1, 1958, in order to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides; to Committee on Merchant Marine and Fisheries.

H. R. 4158 (Dingell) introduced in House Feb. 2, 1965, to provide for advance consultation with the Fish and Wildlife Service and with state wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass bi-

ological controls; to Committee on Merchant Marine and Fisheries.

PESTICIDE RESEARCH: S. 1085 (Mrs. Neuberger) introduced in Senate Feb. 10, 1965, to amend the act of Aug. 1, 1958, as amended, to increase the authorization for pesticide research by the Secretary of the Interior; to Committee on Commerce. Increase would be to \$3.2 million for fiscal year 1966 and \$5 million annually thereafter.

PORT ORFORD, OREGON NAVIGATION PROJECT: S. 467 (Morse and Neuberger) introduced in Senate Jan. 12, 1965, and H. R. 2413 (Duncan of Oregon) introduced in House Jan. 12, 1965, to authorize construction of a navigation project at Port Orford, Oregon, referred to the respective Committees on Public Works. Congressional Record of Jan. 12 contains remarks of Senator Morse on the bill (p. 510) and remarks of Representative Duncan (p. 588) who points out, in part, that in addition to other benefits, this bill will "permit safe moorage of fishing boats and other small craft."

RESOURCES AND CONSERVATION ACT: S. 938 (McGovern and 15 others) introduced in Senate Feb. 1, 1965, H. R. 4430 (Ullman) introduced in House Feb. 4, 1965, to declare a national policy on conservation, development, and utilization of natural resources, and for other purposes; to Senate and House Committee on Interior and Insular Affairs, respectively. Would establish a Council of Resource and Conservation Advisors to review the availability and requirements of natural resources, formulate programs and policies, and report annually to the President. Would provide for special committees in the Senate and House of Representatives to deal with resources and conservation.

SCHOOL LUNCH ACT AMENDMENT: H. R. 3987 (Berry) introduced in House Feb. 1, 1965, to amend the National School Lunch Act in order to extend the provisions of that act to institutions of higher education; to Committee on Education and Labor.

SHRIMP IMPORTS: H. R. 2403 (Colmer) introduced in House, Jan. 12, 1965, to provide for an ad valorem duty on the importation of shrimp; to the Committee on Ways and Means. Would impose a 35 percent duty on imported shrimp. (This bill similar to H. R. 822 and H. R. 1774, 88th Congress, on which no action was taken.)

SMALL BUSINESS DISASTER LOANS: H. R. 2860 (Widnall) and H. R. 2861 (Wyatt) introduced in House Jan. 14, 1965, to amend the Small Business Act to authorize additional funds to be available exclusively for disaster loans; to the Committee on Banking and Currency. (Seems to be similar to P. L. 88-264 enacted by the 88th Congress and signed by the President Feb. 5, 1964.)

SUBMERGED LANDS ACT: Introduced in House Jan. 12, 1965, H. R. 2373 (Boggs), and Jan 13, 1965: H. R. 2664 (Herbert), H. R. 2665 (Long of Louisiana), H. R. 2666 (Morrison), H. R. 2667 (Passman), H. R. 2668 (Thompson of Louisiana), H. R. 2689 (Waggonner), and H. R. 2670 (Willis), to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending 3 marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals, and natural resources within the boundaries; to the Committee on the Judiciary. (Similar to H. R. 116 and other bills in 88th Congress; no action.)

SUSQUEHANNA RIVER BASIN: H. J. Res. 205 (Flood) introduced in House Jan. 18, 1965, to create a regional agency by intergovernmental compact for the planning, conservation, utilization, development, management, and control of the water and related natural resources of the Susquehanna River Basin, for the improvement of navigation, reduction of flood damage, reduction and control of surface subsidence, regulation of water quality, control of pollution, development of water supply, hydroelectric energy, fish and wildlife habitat, and public recreational facilities, and other purposes, and defining the functions, powers, and duties of such agency; to the Committee on the Judiciary.

TRADE AGREEMENT PROGRAM: Senate Feb. 9, 1965, received a letter from the Chairman, U. S. Tariff Commission, Washington, D. C., transmitting pursuant to law, a report on the operation of the trade agreements program, for the period July 1962-June 1963 (with accompanying report); to Committee on Finance.

TRADE COUNCIL: S. J. Res. 36 (Magnuson) introduced in Senate, to develop proposals for the expansion of trade by the establishment of a high-level advisory council; to the Committee on Commerce. Sen. Magnuson in his remarks (Congressional Record, pp. 1711-1712) in the Senate pointed out that the council would advise Congress and the President of the extent to which, and the methods by which, trade in nonstrategic goods and services between the United States and countries within the Communist bloc can profitably be expanded.

TRADE EXPANSION ACT AMENDMENT: Introduced in House: Jan. 4, 1965 H. R. 916 (Whitener) and H. R. 1166 (Secrest), Jan. 5 H. R. 1532 (Dague), Jan. 6 H. R. 1655 (Bow), Jan. 7 H. R. 2096 (Whalley), Jan. 14 H. R. 2843 (Monagan), to amend the Trade Expansion Act of 1962; to the Committee on Ways and Means. Would, in addition to other imported articles described in the Act of 1962, reserve certain imported articles that produce or tend to produce a combined competitive impact upon the like or directly competitive domestic articles or closely related articles from tariff concession negotiations. Prior to such determination, U. S. Tariff Commission would supply the President with a statement that articles meet one or more of the criteria listed in bill in order to reserve those items from the bargaining list at the "Kennedy Round" trade negotiations of GATT at Geneva. Among other things would remove from the bargaining list all commodities for which the Interior Department has research or conservation programs under way pursuant to the Fish and Wildlife Act of 1956. (H. R. 1166, H. R. 1532, and H. R. 2096 shown incorrectly in Commercial Fisheries Review, Feb. 1965 (p. 97) as being similar to H. R. 656 on judicial review of Tariff Commission determinations. Actually they are similar to H. R. 916.)

U. S. FISHING FLEET IMPROVEMENT ACT: Sen. Bartlett in the Senate stated (Congressional Record, Feb. 1, 1965, pp. 1715-1716) that he was pleased that on Jan. 25, 1965, the Department of the Interior conducted the first hearing on an application for a vessel subsidy under Public Law 88-498, the "U. S. Fishing Fleet Improvement Act"; that it would be of great value in the vital, much needed revitalization of our fishing fleet.

VESSEL MEASUREMENT: H. R. 721 (Bonner) introduced in House Jan. 4, 1965, to simplify the admeasurement of small vessels. Would substitute for present complicated method of tonnage measurement a new system which would permit the assignment of tonnages

from a table on the basis of length and breadth only. Tonnage would be limited to self-propelled vessels of less than 500 gross tons and nonself-propelled vessels of not more than 997 gross tons; to the Committee on Merchant Marine and Fisheries. Similar to H. R. 81 and S. 2793 in 88th Congress, no action.

VESSEL NUMBERS: House Jan. 28, 1965, received a letter from the Assistant Secretary of the Treasury, transmitting a certified copy of amendments to the regulations governing the numbering of undocumented vessels, promulgated by the Commandant of the U. S. Coast Guard, pursuant to subsection 7 (a) of 46 U.S.C. 527d; to Committee on Merchant Marine and Fisheries.

Senate Jan. 29, 1965, received a letter from the Assistant Secretary of the Treasury, transmitting, pursuant to law, amendments to the regulations governing the numbering of undocumented vessels, to be published in the Federal Register (with accompanying paper); to Committee on Commerce.

WATER POLLUTION CONTROL ACT: S. 560 (Muskie for himself and 13 others) introduced in Senate Jan. 15, 1965, H. R. 4487 (Farbstein) introduced in House Feb. 8, 1965, to amend the Federal Water Pollution Control Act, as amended, and the Clean Air Act, as amended, to provide for improved cooperation by Federal agencies to control water and air pollution from Federal installations and facilities and to control automotive vehicle air pollution; to Senate and House Committee on Public Works, respectively. Similar to H. R. 982.

WATER POLLUTION CONTROL ADMINISTRATION: Special Subcommittee on Air and Water Pollution of Senate Committee on Public Works held hearing Jan. 18, 1965, on S. 4, Proposed Water Quality Act of 1965. Since S. 4 is essentially the same as S. 649, which was the subject of extensive consideration in the 88th Congress and was passed by the Senate on Oct. 16, 1963, the hearing was restricted to comments from Assistant Secretary of Health, Education, and Welfare; Governor of California; and a panel of witnesses consisting of representatives from the Manufacturing Chemists Association, the Pulp & Paperboard Institute, and National Wildlife Federation.

Water Quality Act of 1965: Hearing before a Special Subcommittee on Air and Water Pollution of the Committee on Public Works, United States Senate, 89th Congress, 1st Session, on S. 4 (a bill to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, to increase grants for construction of municipal sewage treatment works, to authorize the establishment of standards of Water Quality to aid in preventing, controlling, and abating pollution of interstate waters, and for other purposes), Jan. 18, 1965, 143 pp., printed. Besides the text of the bill, contains the report of the Department of Health, Education, and Welfare; statements and communications of various government officials, and associations and organizations.

Majority leader Senator Mansfield (Congressional Record, Jan. 22, 1965, p. D. 31) stated his hope that the bill would be brought to the floor for consideration.

Amendment 4 (Javits) and Amendment 5 (Cooper) to S. 4 were presented to the Senate Jan. 26, 1965; to Committee on Public Works. Sen. Javits' amendment and the text of a letter from New York State Conference of Mayors to the President of the United States describing

the need for modification in the existing water pollution legislation were inserted in that day's Congressional Record (pp. 1252-1253). Sen. Cooper stated his amendment would establish procedures that would, at minimum, give to the States and to interstate agencies acting under compacts, municipalities, and industries which are directly concerned the right to be heard concerning water quality standards, promulgated by the Secretary of Health, Education, and Welfare, to present their views in a public hearing after the standard had been published and to propose revisions of such water quality standards.

Senate Committee on Public Works Jan. 27, 1965, reported favorably with amendments S. 4. Committee on same day reported bill to Senate. Consent was obtained by Sen. Mansfield to file minority views on S. 4.

S. Rept. 10, Federal Water Pollution Control Act Amendments of 1965 (Jan. 27, 1965, report from the Committee on Public Works, U. S. Senate, 89th Congress, 1st Session, to accompany S. 4), 37 pp., printed. Committee reported bill favorably with amendments. Discusses purpose and major provisions of the bill; also presents the individual views of Senator Cooper; changes in existing law.

Senate Jan. 28 passed the bill with amendments, after adopting all committee amendments en bloc, and rejecting several other amendments.

House Feb. 1, 1965, received for concurrence S. 4 passed by Senate Jan. 28; referred to Committee on Public Works.

Introduced in House and similar to S. 4: H. R. 3589 (Edwards of Calif.) and H. R. 3605 (Murphy of New York) Jan. 26, 1965, H. R. 3716 (Monagan) Jan. 27, H. R. 3796 (Flood) Jan. 28, H. R. 3988 (Blatnik) Feb. 1, H. R. 4406 (Patten) Feb. 4, H. R. 4264 (McCarthy) Feb. 3, H. R. 4627 (Fallon) Feb. 9, H. R. 4482 (Dingell) Feb. 8, H. R. 4506 (Olsen of Montana) Feb. 8, H. R. 4792 (Ottinger) Feb. 10, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, to increase grants for construction of municipal sewage treatment works, to authorize the establishment of standards of water quality to aid in preventing, controlling and abating pollution of interstate waters, and for other purposes; to Committee on Public Works. Similar to other bills. Sen. McCarthy in his remarks (Congressional Record, Feb. 3, pp. 1828-1829) pointed out the need to attack the pollution which today menaces not only Lake Erie but most of America's streams, rivers and lakes. He also inserted the address of former Assistant Secretary Frank P. Briggs, U. S. Department of the Interior, at a meeting of the Ohio Commercial Fishermen's Association in Vermillion, Ohio, June 20, 1964.

WATER RESOURCES PLANNING ACT: Irrigation and Reclamation Subcommittee of Senate Committee on Interior and Insular Affairs held hearing Feb. 5, 1965, on S. 21, proposed Water Resources Planning Act of 1965, having as witnesses Bureau of the Budget personnel. Several statements were submitted for inclusion in the record, including one from Sen. Fong. Hearings adjourned subject to call. Subcommittee met Feb. 5 on bill. (The Congressional Record of Jan. 6 listed bill incorrectly as S. 22.)

House Committee on Interior and Insular Affairs held a hearing Feb. 3, 1965, and Full House Committee

considered Feb. 10, H. R. 1111, regarding optimum development of the Nation's natural resources.

Would provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commission, and by providing financial assistance to the states in order to increase state participation in such planning. Water Resources Council would consist of the Secretaries of Interior; Agriculture; Army; and Health, Education, and Welfare; and Chairman of the Federal Power Commission. The Council would have a staff and coordinate planning activities of Federal agencies concerned with water resources. Bill would establish river basin commissions to coordinate Federal, state, interstate, and local plans for water. Would provide Federal financial grants to the states for planning.

WATER RESOURCES RESEARCH: H. R. 3606 (O'Brien) introduced in House Jan. 26, 1965, and S. 22 (Anderson and 18 others) introduced in Senate Jan. 6, 1965, to promote a more adequate national program of water research; to House and Senate Committee on Interior and Insular Affairs, respectively. Similar to S. 267.

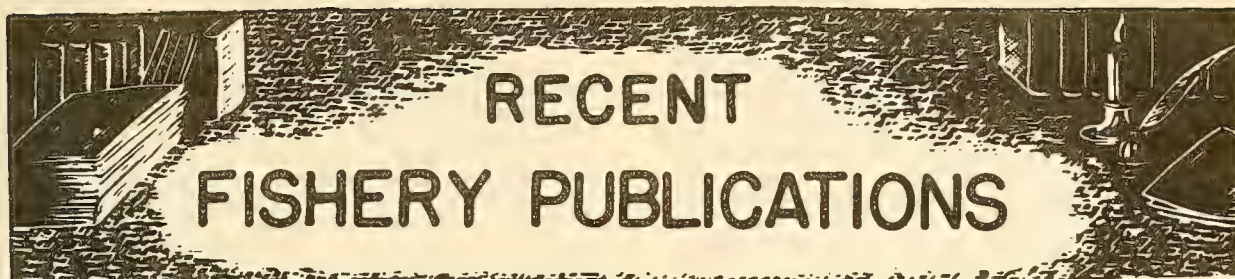
Eighty-Eighth Congress

PESTICIDES AND FISH AND WILDLIFE: Pesticide Research and Controls: Hearing before the Committee on Commerce, United States Senate, 88th Congress, 1st Session, on S. 1250 (a bill to provide for advance consultation with the Fish and Wildlife Service and with State Wildlife Agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls) and S. 1251 (a bill to amend the Act of Aug. 1, 1958, in order to prevent or minimize injury to fish and wildlife from the use of insecticides, herbicides, fungicides, and pesticides), June 6, 1963, Serial 66, 70 pp., printed. Includes texts of bills; Federal government agency reports; statements, letters, wires, resolutions, etc., of various Congressmen, associations and organizations, and individuals.

PRICE QUALITY STABILIZATION: Quality Stabilization: Hearings before a Subcommittee of the Committee on Commerce, United States Senate, 88th Congress, 1st and 2nd Sessions, on S. 774 (a bill to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the right of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes), June 5, Aug. 19, Sept. 9, Oct. 9, Nov. 7, 13, Dec. 9, 1963, Jan. 22, 23, and Feb. 19, 1964, Serial 65, 709 pp., printed. Includes text of bill; comments, statements, and letters from various government agencies, Federal officials, business officials, and organizations.

Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS: The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964, write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3455	- Packaged Fishery Products, 1963 Annual Summary (Revised), 5 pp.
CFS-3515	- Gulf Coast Shrimp Data, 1963 Annual Summary, 53 pp.
CFS-3652	- Massachusetts Landings, April 1964, 9 pp.
CFS-3653	- Massachusetts Landings, May 1964, 9 pp.
CFS-3657	- Gulf Coast Shrimp Data, July 1964, 21 pp.
CFS-3658	- Michigan, Ohio & Wisconsin Landings, July 1964, 4 pp.
CFS-3659	- North Carolina Landings, September 1964, 4 pp.
CFS-3661	- Texas Landings, August 1964, 2 pp.
CFS-3662	- New Jersey Landings, September 1964, 3 pp.
CFS-3663	- Fish Sticks, Fish Portions, and Breaded Shrimp, July-September 1964, 3 pp.
CFS-3664	- California Landings, July 1964, 4 pp.
CFS-3666	- South Atlantic Fisheries, 1963 Annual Summary, 8 pp.
CFS-3667	- Georgia Landings, September 1964, 2 pp.
CFS-3670	- Frozen Fishery Products, October 1964, 8 pp.
CFS-3671	- Imports & Exports of Fishery Products, 1962-63 Annual Summaries, 12 pp.
CFS-3673	- Maryland Landings, September 1964, 4 pp.
CFS-3674	- South Carolina Landings, September 1964, 3 pp.
CFS-3675	- New York Landings, September 1964, 5 pp.
CFS-3676	- Massachusetts Landings, June 1964, 9 pp.
CFS-3677	- Michigan, Ohio & Wisconsin Landings, August 1964, 4 pp.
CFS-3678	- Virginia Landings, September 1964, 4 pp.
CFS-3680	- Shrimp Landings, August 1964, 5 pp.
CFS-3682	- Louisiana Landings, September 1964, 3 pp.
CFS-3685	- Alabama Landings, September 1964, 3 pp.
CFS-3686	- South Carolina Landings, October 1964, 3 pp.
CFS-3687	- Florida Landings, October 1964, 8 pp.
CFS-3689	- Rhode Island Landings, July 1964, 3 pp.
CFS-3690	- Georgia Landings, October 1964, 3 pp.

CFS-3693 - Maine Landings, September 1964, 4 pp.

Sep. No. 726 - Experimental Trawling for High-Seas Salmon.

Sep. No. 727 - Estimating Residual Shell in Shucked Soft-Shell Clams (*Mya arenaria* L.).

FL-448 - Some Publications on Fish Culture and Related Subjects, 14 pp., revised August 1964.

FL-571 - Parasites of Freshwater Fish. II--Protozoa. 1--Microsporidea of Fish, by R. E. Putz, 4 pp. illus., August 1964.

FL-574 - Fishing Vessel Construction Differential Subsidy, 14 pp., processed, November 1964. Discusses the United States Fishing Fleet Improvement Act (P. L. 88-498), approved August 30, 1964, effective December 22, 1964. The purpose of the Act is to correct inequities in the cost of construction of U. S. fishing vessels. The Secretary of the Interior is authorized to pay up to 50 percent of the cost of construction of a new fishing vessel provided the vessel, the owner of the vessel, and the fishery in which the vessel will operate meet certain requirements. The amount that can be paid is limited to the difference between the cost of construction in domestic and foreign shipyards or 50 percent of the domestic cost, whichever is smaller. The determination of the foreign cost will be made by the Maritime Administrator. Eligibility for the subsidy is restricted to vessels of advanced design, capable of fishing in expanded areas (fishing grounds not usually fished by the majority of vessels working in a particular fishery), equipped with newly developed gear, and scheduled for operation in a fishery where such use will not cause economic hardship to other operators now in that fishery. ("Newly developed gear" is defined as the most modern gear available that is suitable for use in the fishery for which the proposed vessel is designed.) The regulations provide for hearings on each contract under the new law. Such hearings will allow any person who feels he will be economically injured by the construction of the proposed vessel an opportunity to present evidence of potential economic losses. The United States Fishing Fleet Improvement Act authorized the appropriation of \$10 million annually for the construction subsidy program. Congress has appropriated \$2½ million to start the program during the current fiscal year (ending June 30, 1965).

SSR-Fish, No. 488 - Spawning Ground Catalog of the Kvichak River System, Bristol Bay, Alaska, compiled by Robert L. Demory, Russell F. Orrell, and Donald R. Heinle, 302 pp., illus., June 1964.

Annual Report for 1963, Division of Fishery Management Services, by Willis King, Circular 194, 50 pp., illus., July 1964. Includes information on accomplishments of the Division of Fishery Management Services of the U. S. Bureau of Sport Fisheries and Wildlife during 1963; fishery management programs on Federal areas and Indian reservations, including Department of Defense areas, National forests and parks, wildlife refuges, Veterans Administration areas, and others; cooperation with other divisions of the Bureau of Sport Fisheries and Wildlife; cooperation with the states in striped bass spawning study, Kentucky trout stream survey, river investigations, and acid mine pollution studies; fishery management programs on other waters such as privately-owned lakes; training and extension activities; and cooperative fishery units.

Fishery Bulletin, vol. 63, no. 2, 1964, 242 pp., illus., printed. Contains articles on: "Sexual maturation and spawning of Atlantic menhaden," by Joseph R. Higham and William R. Nicholson; "An experimental evaluation of the C¹⁴ method for measuring phytoplankton production using cultures of *Dunaliella primolecta* Butcher," by William H. Thomas; "Dentition of the northern fur seal," by Victor B. Scheffer and Bertram S. Kraus; "A benthic community in the Sheepscot River Estuary, Maine," by Robert W. Hanks; "Upwelling in the Costa Rica Dome," by Klaus Wyrski; "Preconstruction study of the fisheries of the estuarine areas by the Mississippi River-Gulf Outlet Project," by George A. Rounsefell; "A morphometric study of yellowfin *Thunnus albacores* (Bonnaterre)," by William F. Royce; "Origins of high seas sockeye salmon," by Fred C. Cleaver; and "The relation between spawning-stock size and year-class size for the Pacific sardine (*Sardinops caerulea* Girard)," by John S. MacGregor.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FREE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-10	- Swedish Fisheries, 1963, 10 pp.
MNL-13	- India's Fishing Industry, 1963, 12 pp.
MNL-17	- Italian Fisheries, 1963, 9 pp.
MNL-23	- Fisheries of Chile, Part I, North Chile, 1963 and January-June 1964, 32 pp.
MNL-60	- Netherland's Fisheries, 1963, 8 pp.
MNL-93	- Tuna Fishery of Western and Southern Africa, 13 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE REPORT IS AVAILABLE ON LOAN ONLY FROM THE BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

Fishing for Cephalopod Mollusks and Their Biological and Economic Importance, by Elvezio Chirardelli, 8 pp., processed, 1962. (Translated from the Italian, General Fisheries Council for the Mediterranean Technical Paper No. 40/60.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, November 1964, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices

for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, November 1964, 17 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, November 1964, 8 pp., illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, September and October 1964, 18 and 19 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, November 1964, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 608, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Halibut and Troll Salmon Landings and Ex-Vessel Prices for Seattle, Alaska Ports and British Columbia, 1964-1963, 35 pp., December 18, 1964. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Bldg., Seattle, Wash. 98104.) Gives landings and ex-vessel prices of troll salmon and halibut at leading United States ports of the Pacific Coast; ex-vessel halibut prices and landings at leading British Columbia ports; United States and Canadian Pacific Coast halibut landings, 1936-1964; halibut landings at leading Pacific Coast ports, 1961-1964; and troll salmon landings and receipts at Seattle and Alaska ports, 1961-1964.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November and December 1964, 4 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Caro-

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lina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the months indicated.

New England Fisheries--Monthly Summary, November 1964, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary, September 1964, 19 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, December 1964, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ACCLIMATIZATION:

"Ispol'zovanie vnutrividovoi izmenchivosti v rabotakh po akklimatizatsii ryb" (Use of intra-species variability in work on the acclimatization of fish), by S. I. Doroshev, article, *Referativnii Zhurnal-Biologiya*, 1963, No. 8196, printed in Russian, *Akademika Nauk SSSR, Nauchnoi-Informatsii, Moscow, U.S.S.R.*

ALEWIVES:

A Report upon the Alewife Fisheries of Massachusetts, Contribution No. 11, 135 pp., illus., reprinted, 1964, 71 cents. Division of Marine Fisheries, Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass. Part I discusses the importance of the alewife fishery, natural history, natural and artificial fisheries, causes of the decline in the fishery, and remedial measures for reconstruction of the industry. In Part II, a brief description of each alewife stream in Massachusetts is given, and the practical methods for restoration of the fishery are presented.

ALGAE:

Automatic Control of Algae Cultures, by Ye. A. Ivanov and I. V. Aleksandrova, OTS 63-41013, 8 pp., processed, Oct. 28, 1963, 50 cents. (Translated from the Russian, *Uspekhi Sovremennoy Biologii*, vol. 56, no. 1, 1963, pp. 90-97.) Office of Technical Services, U. S. Department of Commerce, Wash., D. C. 20230.

"Chemical studies on the green alga, *Monostroma nitidum* Wittrock. III--Inorganic components of the alga and its mucilage," by Shizuhiko Maeshige, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 29, Apr. 1963, pp. 359-361, printed, *Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.*

"Lipids of algae. Part III--The components of unsaponifiable matter of the algae *Chlorella*," by Ihei Iwata and Yosito Sakurai, article, *Agricultural and Biological Chemistry*, vol. 27, Apr. 1963, pp. 253-258, printed, Charles E. Tuttle Co., Tokyo, Japan.

The following reports, processed in Spanish, are part of the Serie: *Trabajos de Divulgacion* and are available from the Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

Clave Dicotomica para la Determinacion de Algas Marinas del Pacifico (Dichotomous Key for the Identification of Marine Algae of the Pacific), by Gilbert M. Smith, vol. VII, no. 68, 27 pp., Sept. 1963. (Translated from the English, *Marine Algae of the Monterey Peninsula, California, 1944.*)

La Explotacion de Algas en Baja California (The Exploitation of Algae in Baja California), by Hector Chapa Saldana, vol. IX, no. 84, 34 pp., 1964.

Notas sobre el Aprovechamiento Industrial de Algunas Agarofitas (Notes on the Industrial Utilization of some Agar-Bearing Plants), by Hector Chapa Saldana, vol. VI, no. 64, 26 pp., June 1963.

ALGERIA:

Foreign Trade Regulations of the Republic of Algeria, by Robert S. McClellan, OBR 64-122, 8 pp., printed, Nov. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The primary aims of the Algerian Government's foreign trade policy are the limitation of imports to those items considered essential for domestic consumption or economic development and the protection of local production. The report discusses

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Algeria's import tariff system, sales and other internal taxes, documentation and fees, labeling and marking requirements, and special customs provisions. Also covers nontariff import controls, export controls, United States foreign trade controls, and Government representation between the two countries.

ALMANAC:

The American Ephemeris and Nautical Almanac for the Year 1966, 508 pp., illus., printed, 1964, \$3.75. Nautical Almanac Office, U. S. Naval Observatory, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Basic calculations and data, fundamental tables and constants.

ANCHOVY:

"Vesennyya migratsiya chernomorskoi khamsy v 1959 g. i prispособitel'nye osobennosti ee nerestov-ykh populyatsii" (Spring migration of the Black Sea anchovy in 1959 and the adaptive characteristics of its spawning population), by N. N. Danilevskii, article, *Referativnii Zhurnal-Biologiya*, 1963, Abstract No. 8155, printed in Russian. Akademiia Nauk SSSR, Nauchnoi-Informatsii, Moscow, U.S.S.R.

BOTULISM:

"A simple method for the detection of Botulinus toxins and bacilli," by M. Zeller, article, *Archiv fur Lebensmittelhygiene Insbesondere fur Fleisch, Fisch, und Milchhygiene*, vol. 15, no. 4, 1964, pp. 84-87, printed in German. Verlag M & H Schaper, Grazer Strasse, Hannover 20, Germany.

"What you should know about Botulism," article, *Food Engineering*, vol. 36, July 1964, pp. 104-106, printed. Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

BRAZIL:

The following publications are reprinted (in Portuguese) from *Boletim de la Sociedade Cearense de la Agronomia*, vol. 5, June 1964. Sociedade Cearense de la Agronomia, Fortaleza, Ceara, Brazil:

Pescarias de Jangadas no Litoral Sul de Pernambuco, Brasil ("Jangadas" Fisheries on the Southern Coast of Pernambuco, Brazil), by Hitoshi Nomura, pp. 67-76, with English summary.

Sobre a Producao Brasileira de Pescado, no Quinquenio 1956-1960 (On Brazilian Fishery Production, in the Five-Year Period 1956-1960), by Melquiades Pinto Paiva, pp. 87-98.

CANADA:

"Canadian summer fisheries, 1964," article, *Trade News*, vol. 17, no. 4, Oct. 1964, pp. 9-13, processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. In Canada expansion is strongest on the Atlantic coast where new large freezing plants are coming into production and where the fishermen in 1964's spring and summer fisheries earned nearly C\$59 million, about \$6 million more than in 1963 and \$12 million more than the five-year average of 1959-63. In the Maritimes, the 3-million-pound increase over the previous year in the inshore groundfish catch was due in part to greater effort, resulting from uniformly high prices

to fishermen. To the end of August the 1964 output of frozen sea fish, excluding shellfish, was 16 percent greater than in 1963 and sales were so satisfactory that stocks on hand were smaller by 18 percent. The scallop industry continued its expansion with a summer catch of over 8 million pounds valued at between \$3 and \$4 million, one million dollars more than in the previous summer. The swordfish catch continued its sharp climb in quantity and value. Fishermen in Quebec, however, were not so fortunate. After an excellent spring, with good catches of cod, halibut, herring, and smelts, their summer operations were not so successful. Newfoundland fishermen's gross income for 1964 stood at the end of August at \$15.5 million. British Columbia's salmon catch was better than expected, the pack already exceeding one million cases at the end of August with large supplies coming regularly. The decline in fresh-water fisheries was due to smaller catches and consequently smaller output.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 5, Sept. 1964, 479 pp., illus., printed, single copy C\$2.25. Queen's Printer, Ottawa, Canada. Includes, among others, these articles: "A new species of parasitic copepod, *Caligus clemensi* sp. nov. (Caligoida: Caligidae), from pelagic fishes in the coastal waters of British Columbia," by R. R. Parker and L. Margolis; "Preliminary observations on the vertical distribution of Pacific salmon (genus *Oncorhynchus*) in the Gulf of Alaska," by J. I. Manzer; "Ocean growth and mortality of pink and chum salmon," by W. E. Ricker; "Oceanographic regions and assessment of temperature structure in the seasonal zone of the north Pacific Ocean," by John P. Tully; "Salinity preference: an orientation mechanism in salmon migration," by John E. McInerney; "Estimation of sea mortality rates for the 1960 brood-year pink salmon of Hook Nose Creek, British Columbia," by Robert R. Parker; "Seasonal variations in the sterol, fat and unsaponifiable components of scallop muscle," by D. R. Idler, T. Tamura, and T. Wainai; "Preliminary results of studies on growth and mortality of Pacific cod (*Gadus macrocephalus*) in Hecate Strait, British Columbia," by K. S. Ketchen; "Growth rate of central British Columbia pink salmon (*Oncorhynchus gorbuscha*)," by R. J. LeBrasseur and R. R. Parker; "Distribution and synonymy in the Pacific Ocean, and variation, of the Greenland halibut, *Reinhardtius hippoglossoides* (Walbaum)," by Carl L. Hubbs and Norman J. Wilimovsky; "Distribution of introduced marine Mollusca in British Columbia waters," by D. B. Quayle; "The respiratory metabolism and swimming performance of young sockeye salmon," by J. R. Brett; "Ocean migrations of Pacific salmon," by Ferris Neave; "A model for simulation of the population biology of Pacific salmon," by P. A. Larkin and A. S. Hourston; "A key to five species of Pacific salmon (genus *Oncorhynchus*) based on scale characters," by H. T. Bilton, D. W. Jenkinson, and M. P. Shepard; "A Quantitative estimate of the number of Pacific herring in a spawning population," by D. N. Outram and F. H. C. Taylor; and "Further information on spawning stock size and resultant production for Skeena sockeye," by M. P. Shepard and others.

Rapport sur les Pecheries pour l'Exercice Financier 1962/63 (Report on the Fisheries for the Fiscal Year 1962/63), 1 vol., illus., printed in French. Quebec Department of Trade and Commerce, Quebec, Canada.

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Seventeenth Annual Report, 1963/64, 11 pp., printed, 1964. Fisheries Prices Support Board, Ottawa, Canada.

CANNING:

"Fish cooker tray," (British Patent 935,989), article, Food Manufacture, vol. 39, May 1964, p. 81, printed. Grampian Press, Ltd., The Tower, Shepherds Bush Rd., Hammersmith, London W6, England.

CEYLON:

Administration Report of the Director of Fisheries for 1962-63, Part IV--Education, Science and Art (L), 84 pp., printed in Sinhalese and English, 2/75 plus postage -/50 (about 55 U. S. cents plus postage). Government Publications Bureau, P. O. Box 500, Secretariat, Colombo, Ceylon. Reports on the activities of the Ceylon Department of Fisheries for 1962-63. Includes information on international assistance, disputes and regulations, loans to fishermen, cooperative societies, housing for fishermen, coastal navigation aids, and fishing harbors. Also covers fresh- and brackish-water fisheries, pearl fisheries, Mutwal fisheries factory and harbor, trawler fishing, and fisheries research. Included are statistical tables giving data on production of fresh-water and marine fish, mechanized fishing vessels, and imports and exports of fishery products for fiscal year October 1962-September 1963.

Bulletin of the Fisheries Research Station, Ceylon, vol. 17, no. 1, June 1964, 150 pp., illus., printed, single copy Rs. 5.00 (about US\$1). Fisheries Research Station, Colombo, Ceylon. Includes these articles: "Socio-economic survey of fisher families, 1958-59," by G. N. De Silva; "A review of the parasitic copepods of fish recorded from Ceylon with descriptions of additional forms," by P. Kirtishighe; and "Assessment and possible development of the fishery resources of Pedro Bank," by S. Sivalingam.

CLAMS:

The following reports are available from the Division of Marine Fisheries, Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass.:

The Quahaug Fishery of Massachusetts (Including the Natural History of the Quahaug and a Discussion of Quahaug Farming), by David L. Belding, Marine Fisheries Series--No. 2, Contribution No. 5, 41 pp., illus., reprinted, 1964, 44 cents. Part I, covering the natural history of the quahaug, discusses its anatomy, early life history, the habits of the quahaug, the rate of growth, natural conditions affecting growth, and growth tables. Part II, concerning the quahaug fishery, describes the fishing grounds, industrial practices, laws pertaining to that clam, and quahaug culture.

The Soft-Shell Clam Fishery of Massachusetts (Including the Natural History of the Soft-Shell Clam and a Discussion of Sewage Pollution and Shellfish), by David L. Belding, Marine Fisheries Series--No. 1, Contribution No. 3, 65 pp., illus., reprinted, 43 cents, 1964. Part I, on natural history of the soft-shelled clam (*Mya arenaria*), covers distribution, anatomy, spawning, early life history, movements, enemies, growth, conditions regulating its growth, and growth tables. Part II, on clam culture, discusses clam farming, laws, operating the clam farm, and the clam set.

Part III, on the Massachusetts clam fishery, covers history of the fishery, fishing grounds, the clam industry, and methods of improving the clam fishery. Part IV, on sewage pollution and shellfish, describes shellfish and disease, methods of determining polluted shellfish areas, shellfish pollution in Massachusetts, biological activities of the clam, and purification by chlorine treatment.

CLAMS AND OYSTERS:

A Report upon the Quahaug and Oyster Fisheries of Massachusetts (Including the Life History, Growth and Cultivation of the Quahaug--Venus mercenaria--and Observations on the Set of Oyster Spat in Wellfleet Bay), Contribution No. 12, 205 pp., illus., printed, 1964, 89 cents. Division of Marine Fisheries, Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass. The section devoted to the quahaug discusses the distribution and range of that clam; the anatomy and its relation to the quahaug's habits; and the spawning, early life history, reproduction, and propagation. Also covered are the habits of both young and adult, the rate of growth, the quahaug fishery--its present extent and possibilities, and the cultivation of quahaugs. The section on oyster spat includes information on the natural history of the American oyster (*Ostrea virginica*), methods of spat collection, spat conditions in Wellfleet Bay, collection of spat with a plankton net, spat-collecting experiments, and results of a spat survey in Wellfleet Bay in 1908.

COD:

"The effect of gear on spawning cod," by Gunnar Sundnes, article, World Fishing, vol. 13, July 1964, pp. 59-60, printed. John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

"Polyphosphate treatment of frozen cod. Protein extractability and lipid hydrolysis," by W. J. Dyer and others, article, Journal of the Fisheries Research Board of Canada, vol. 21, no. 1, Jan. 1964, pp. 101-106, illus., printed. Queen's Printer, Ottawa, Canada.

The following articles are from Rybnoe Khoziaistvo, 1962. Rybnoe Khoziaistvo, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.:

"Biologiya treski raionov Labrador i N'yufaundlenda" (Biology of the cod of the Labrador and Newfoundland regions), by A. I. Postolakii, pp. 345-354, printed in Russian with English summary.

"Nekotorye dannye po pitaniyu treski v N'yufaundlenskom raione Severo-Zapadnoi Atlantiki" (Some data on the food of cod in the Newfoundland region of the northwestern Atlantic), by O. A. Popova, pp. 235-253, printed in Russian with English summary.

"Pitanie treski v vodakh Zapadnoi Grenlandii" (The food of cod in West Greenland), by I. N. Sidorenko, pp. 255-261, printed in Russian with English summary.

"Razmernovozrastnoi sostav i nerest treski na yugo-zapadnom sklone banki Flemish-Kap" (Size and age composition and spawning of cod on the southeastern slope of the Flemish Cap), by E. M. Mankevich and V. S. Prokhorov, pp. 355-360, printed in Russian.

COMMISSIONS:

Gulf States Marine Fisheries Commission Fifteenth Annual Report, 1963-1964 (to the Congress of the

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United States and to the Governor and Legislators of Alabama, Florida, Louisiana, Mississippi, and Texas), 44 pp., illus., printed. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans, La. 70112. Outlines the Commission's activities for the period Oct. 1963-Oct. 1964, with a summary of actions and recommendations. Describes briefly the activities of each of the member States during that period. Includes short discussions of U. S. Fish and Wildlife Service activities in shellfish, menhaden, bottomfish, and pelagic fish exploration; offshore gear research; faunal assessment; experiments in electrical stimulation of pink shrimp; and studies of spawning and population dynamics of shrimp. Also discusses the shrimp ecology program, estuarine program, industrial bottomfish studies, pesticides program, red tide program, biochemical studies of blue crab, studies of the botulism organism, standards and specifications program, the Inspection Service, marketing programs, and financial assistance to the commercial fishing industry. Also contains the financial report of the Commission for the year ended June 30, 1964.

CONGO REPUBLIC (BRAZZAVILLE):

Basic Data on the Economy of the Republic of Congo (Brazzaville), by Charles E. Rushing, OBR 64-100, 12 pp., illus., printed, Nov. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Congo has few natural resources and generally infertile soil. The agriculture is almost entirely oriented toward the production of foodstuffs for local consumption. The country's industrial production is relatively insignificant, limited to the wood industry, sugar refining, soap, beer, and canned fish. The report discusses general information on the two Congos, geography and climate, Government, population, and education; structure of the economy; agriculture; livestock; forestry; petroleum and mining; industry; and power supplies. Also covers transportation, communications, finance, foreign trade, program for economic development, marketing, and diplomatic representation between the Congo and the United States. A section on fishing and fish processing explains that most fishing is done along ocean beaches and river banks, and the catch is generally consumed by the African population. A new fishing operation has recently begun construction of a 1,500 ton freezing and temporary cold-storage plant for tuna which is shipped to the United States and Europe for canning.

COOLING:

"Cooling fish in ice and sea water," by J. Herrmann and A. Wolschon, article, Journal of the Science of Food and Agriculture, vol. 14, no. 12, 1963, p. ii 304, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

CRABS:

King Crab, PARALITHODES CAMTSCHATICA (Tilesius), Trawl Survey of Long Island Bank, East of Kodiak Island, Alaska, June 1963, by Richard E. Reynolds and Guy C. Powell, Informational Leaflet 44, 8 pp., illus., processed, Aug. 1964. Department of Fish and Game, Subport Bldg., Juneau, Alaska.

"Processing of canned crab from frozen material," by E. Tanikawa, M. Akiba, and T. Motohiro, article,

Refrigeration, vol. 39, no. 437, Mar. 1964, pp. 1-10, illus., printed in Japanese. Nihon Reito Kyokai, No. 3, 1-Chome, Ginza Nishi, Chuo-ku, Tokyo, Japan.

The following reports, processed in Spanish, are part of the Serie: Trabajos de Divulgacion and are available from the Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.:

Claves de Identificacion de Cangrejos Grapsoideos de America (Key to the Identification of Grapsoid Crabs of America), by Mary J. Rathbun, vol. IX, no. 82, 47 pp., illus., Jan. 1964. (Translated from the English, The Grapsoid Crabs of America, Bulletin 97, U. S. National Museum, Washington, D. C., 1918.)

Claves de Identificacion para los Cangrejos Oxystomatados de America (Key to the Identification of the Oxystomatous Crabs of America), by Mary J. Rathbun, vol. IX, no. 83, 21 pp., illus., Apr. 1964. (Translated from the English, The Oxystomatous and Allied Crabs of America, Bulletin No. 166, U. S. National Museum, Washington, D. C., 1937.)

CRAYFISH:

"Adaptation in stretch receptor neurons of crayfish," by Shigehiro Nakajima, article, Science, vol. 146, no. 3648, Nov. 27, 1964, pp. 1168-1170, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

CROAKER:

Studies on the Fishery Biology of the Yellow Croaker in the East China and the Yellow Seas, by Ikuo Ikeda, Bulletin No. 31, 80 pp., printed in Japanese with English summary, 1964. Sekai Regional Fisheries Research Laboratory, Suisan-cho Seikai-ku, Suisan Kenkyusho, Maruo-Machi, Nagasaki-shi, Japan.

CRUSTACEANS:

Lista Preliminar de los Crustaceos Existentes en el Laboratorio Central del I.N.I.B.P. (Preliminary List of the Crustaceans Living in the Central Laboratory of the National Institute for Fishery Biological Investigations), by Hector Chapa Saldana, Serie Trabajos de Divulgacion, no. IX, no. 87, 41 pp., processed in Spanish, Feb. 1964. Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

DENMARK:

Danmarks Fiskeri Erhverv (Denmark's Fishing Industry), Vol. I, edited by Anders Finsing, 473 pp., Apr. 1964; Vol. II, edited by Zinklar Zinglersen, 523 pp., October 1964, illus., printed in Danish, limited edition, \$90. Forlaget Liber A/S, Copenhagen, Denmark. Volume I consists of 10 sections preceded by a historical review of the fisheries. The sections include one or more articles by experts in the various fields. With a few exceptions most of the articles are historical and general in content. The sections cover the following subjects: (1) growth of fishing industry organizations--2 historical articles on the 2 largest organizations of fishermen; (2) the fishermen in art and culture--4 articles with more history and references to the stage, literature, and painting; (3) vessels,

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methods, and gear--4 general articles on vessel history, steel cutters, mechanization, and methods and gear; (4) allied services--articles on rescue services, rescue vessels, and weather and radio services; (5) trade and industry--12 articles on canning, filleting, industrial fish, fish meal and oil, pond trout culture, pond trout research, smoking, wholesaling and exporting, retailing, Copenhagen's Fish Market, fishery cooperatives, and present industry structure; (6) Greenland and the Faroes--2 general articles summarizing the fish and fisheries of Greenland and a brief review of the Faroese industry; (7) research--a 28-page explanation of research programs and progress; (8) insurance and financing--2 brief but descriptive articles on fishermen's accident insurance and vessel insurance, and one on industry financing; (9) education--a historical general discussion; and (10) administration and organizations--a listing of Fisheries Ministry officials, offices, laboratories, and other activities plus brief data on the 2 large fishermen's organizations and the national association of organizations, and on 14 smaller trade groups organized according to their producing, processing, and marketing interests. Volume II represents the first attempt to provide biographical and technical data on living persons engaged in the Danish fishing industry. About 4,800 persons are included, listed alphabetically by surname. The average sketch runs about 70 words, concluding with the current occupation and address. About one-third of the sketches include photographs. A spot check of the entries indicates that a great many are vessel skippers, simply because the Danish fishing fleet has over 4,000 motored vessels over 5 gross tons. However, other activities in the fishing industry also seem to be relatively well represented.

--A. W. Anderson

Fiskeriarbogen 1965 (The Fisheries Yearbook, 1965), edited by J. Fr. Simony, 861 pp., illus., printed in Danish, Nov. 1964, 13 Kr. (about US\$1.90) plus 9 percent tax. Iver C. Weibach & Company, Amaliegade 30, Copenhagen K, Denmark. A comprehensive collection of information on navigation, fishery rules and regulations, inspection, and other information, primarily for Danish, Faroese, and Greenland fishermen, but it also is used by yachtsmen and small craft. It is issued annually by the Ministry of Fisheries in December for the following year, the current issue being the 72nd edition. Subjects covered include the 1965 calendar; navigation tables, courses, and distances; rules of navigation and carrying of lights--harbor bylaws, buoyage, precautions with respect to submarine cables, light and signal stations, radio telephony, and telegraphy; and Acts and regulations governing the fishing industry (including the Northeast Atlantic Convention) in Denmark, Faroe Islands, and Greenland--control of quantity and exports of fish, fisheries statistics, and shipping. Also discussed are harbor signal letters and index of fishing vessels; Acts and regulations governing inspection of ships, ship construction and equipment, medical supplies, and medical examination of crews; fishery inspection and quarantine regulations; accident insurance; Acts concerning loans to the fishing industry; Acts and regulations about hunting; guidance on shipwrecks and accidents; institutions and addresses; and fish names and market classifications, courses, measures and weights. There is a

detailed alphabetical index of the subject matter, and a list, by type of product, of the numerous trade advertisements in the Yearbook. The final section is an illustrated article "Aids to navigation (buoyage) in Danish Waters." The Nordic countries have agreed upon uniform colors for marking buoys. Danish authorities will carry out the changes in Danish waters in the spring of 1965.

--A. W. Anderson

DIRECTORIES:

Fisheries Year Book and Directory, 1964, 508 pp., illus., printed, \$4.50 postpaid. British-Continental Trade Press Ltd., 222 Strand, London WC2, England. Contains short summaries of fishery landings and production in some of the leading countries of the world. After a short introductory chapter on the prospects for the world's fisheries, the book describes developments, landings, and production in the United Kingdom, United States, Japan, Iceland, the U.S.S.R., and the Federal Republic of Germany. Under the title of "Around the World," there are pithy summaries covering catches, foreign trade, processing, fishing fleets, and industrial products in 54 other countries from Algeria to Zanzibar. Under "Preservation of Fish" is described the work of the Torrey Research Station (Aberdeen) and the Humber Laboratory (Hull). Progress in quick-freezing, packaging, and handling frozen fish is discussed. There are articles on (1) standards and requirements for handling, processing, and distribution of fish and quality control; (2) manufacture of fishing nets; (3) developments in fish meal. A chapter on the construction and design of fishing vessels describes features of interesting new vessels built in 1963, and lists the vessels built or under construction in various fishery countries. Includes a dictionary of fish names in eight languages; a fish supply calendar; a list of the fishery organizations throughout the world; a list of trade journals of interest to the fishery industry; a world directory giving the particulars of over 5,000 firms in 68 countries, including fishing companies, wholesalers, importers, canners, firms dealing in fish byproducts, suppliers (of machinery, equipment, and packing materials), and cold-storage and transport firms; a list of trade marks; and a classified guide for buyers. An unusual feature is photographic plates showing 9 stamps with fish designs issued by Vietnam and the Maldives Islands.

DOLPHINS:

"Microvibrations in man and dolphin," by Manfred Haider and Donald B. Lindsley, *Science*, vol. 146, no. 3648, Nov. 27, 1964, pp. 1181-1183, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

ELECTRICAL FISHING:

"Applications de la pêche électrique à la récolte d'animaux pour aquariums" (Application of electrical fishing methods in collecting animals for aquariums), by Pierre Lamarque, article, *Ier Congrès International d'Aquariologie*, vol. D, pp. 109-115, printed in French with German and English summaries, 1963. Musée Océanographique, Monaco-Ville, Monaco.

FATTY ACIDS:

"A comparative study on fatty acid composition of shellfish," by Y. Shimma and H. Taguchi, article,

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Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, 1964, p. 153, printed in Japanese, Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

"The effect of environmental temperature on the fatty acid composition of crustacean plankton," by Tibor Farkas and Sandor Herodek, article, Journal of Lipid Research, vol. 5, July 1964, pp. 369-373, printed, University Publishers, Inc., 59 E. 54th St., New York, N. Y. 10022.

"Fatty acid composition of vitamin A ester contained in fish liver oil," by T. Kinumaki, H. Taguchi, and K. Iwasaki, article, Chemical Abstracts, vol. 59, 1963, col. 15506, printed, The American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

FISH-LIVER OIL:

"Some nutritional aspects of cod liver oil. I--Its essential fatty acid and hypocholesterolaemic activity," by S. A. Reed, article, Journal of the Science of Food and Agriculture, vol. 15, June 1964, pp. 399-407, printed, Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

FISH MEAL:

Fish Meal Bag Material vs. Spontaneous Heating, Progress Report No. 73, 4 pp., illus., printed, 1964, Fishing Industry Research Institute, University of Cape Town, Rondebosch, Cape Province, Republic of South Africa.

"Fish oil-solvent-water system examined for the foundation of the preparation of fatless fish meal," by K. Suzuki and K. Saruya, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, 1964, p. 37, printed in Japanese, Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

"Herring meal, antioxidants and the quality of meat--results of feeding experiments," by H. Astrup, H. Hvidsten, and L. Aure, article, News Summary, no. 15, Sept. 1964, pp. 54-64, processed in English with French, Spanish, and German summaries, limited distribution, International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

"The influence of solvent extracted fish meal and stabilized fish oil in broiler rations on performance and on the flavor of broiler meat," by J. O. Hardin, J. L. Milligan, and Virginia D. Sidwell, article, Poultry Science, vol. 43, July 1964, pp. 858-860, printed, Poultry Science Association, Kansas State College, Manhattan, Kans.

"Pepsin digestibility as an index of quality in fish meal. Part II--Some British studies," by J. A. Lovern, June Olley, and R. Pirie; "Some South African studies," by G. M. Dreosti, S. G. Wiechers, and W. J. Conradie, articles, Fishing News International, vol. 3, no. 4, Oct.-Dec. 1964, pp. 310, 312, 314-316, 318, illus., printed, single copy 6s. 6d. (about 95 U.S. cents), Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England. The British studies concluded that the sensitivity of the pepsin digestibility test can be greatly increased by drastic reduction in the strength of the pepsin solution, that is, to one thousandth of the standard in the

AOAC (Association of Official Agricultural Chemists) method. Also, it is only possible to compare different types of fish meal by this test when allowance is made for the varying content of water-soluble nitrogenous material. Such "corrected" pepsin digestibilities appear to show a reasonable correlation with available lysine values. The South African studies showed that a crude relationship was found to exist in the practical application between available lysine and a function of digestibility and solubility of fish meal.

FISH OIL:

"Refining of crude commercial sardine oil," by D. P. Sen and others, article, Food Science, vol. 12, 1963, p. 189, printed, Central Food Technological Research Institute, Mysore, India.

FISH PROTEIN CONCENTRATE:

"Fish flour in replacement of dry buttermilk and soybean meal in starter rations for pigs," by J. C. Hillier, Ray Washam, and Lynn Byram, article, Feed-stuffs, vol. 36, Aug. 22, 1964, pp. 58-59, printed, Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

The following articles appeared in News Summary, no. 15, Sept. 1964, processed in English with French, German, and Spanish summaries, limited distribution, International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England;

"An assessment of nutritive value of fish flour in the treatment of convalescent Kwashiorkor patients," by P. J. Pretorius and A. S. Weymeyer, pp. 98-114.

"United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas--Fish flour production in Sweden," by Bo Hallgren, pp. 30-35.

FISH STOCKS:

"Biological aspects, their influence on future supplies," by H. A. Cole, article, Chemistry and Industry, no. 29, July 18, 1964, pp. 1293-1295, printed, Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

FLORIDA:

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The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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"New purse seine hauling system," article, World Fishing, vol. 13, June 1964, pp. 37-38, printed. John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

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(Reprinted from Fishery Technology, vol. 1, no. 1.) Government of India, Offshore Fishing Station, Cochin-5, India.

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The Georgia Game and Fish Department; Its Management and Operations, 26 pp., printed, 1964.

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"Report on fitting outboard motors to Ghanaian fishing canoes (April 1959)," by G. C. Rawson, pp. 1-7.

"Report on population and earnings survey of Faana fishing villages of Accra (February-March 1961)," by H. S. Dua, pp. 8-26.

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Halibut Preying on Large Crustacea, by George W. Gray, Jr., 1 p., illus., printed. (Reprinted from Copeia, no. 3, Sept. 10, 1964, p. 590.) American Society of Ichthyologists and Herpetologists, 18111 Nordhoff St., Northridge, Calif.

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Hawaii Marine Laboratory, University of Hawaii, by Albert H. Banner, Contribution No. 191, 3 pp., illus., printed. (Reprinted from American Zoologist, vol. 3, no. 3, Aug. 1963.) American Society of Zoologists, 104 Liberty St., Utica, N. Y. Discusses the history of the Laboratory and its administration; use by scientific researchers; and its ideal geographical location. Also discusses research on the biology of reef and inshore animals, current studies on systematics, embryology, ecology, behavior, and physiology of both invertebrates and fish; and programs with national-agency support including studies on toxicity of marine fish, ecological succession on submarine lava flows, investigation of trophic levels by means of isotopic tracers, and studies in marine parasitology. Also covers laboratory facilities at the Waikiki and Coconut Island laboratories, planned additional facilities, Laboratory publications, and collection of local marine animals.

HERRING:

"Chemical studies on the herring (*Clupea harengus*). X--Histidine and free sugars in herring flesh," by

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R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 15, May 1964, pp. 293-299, printed. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

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"Oxygen uptake of developing eggs and larvae of the herring (*Clupea harengus*)," by F. G. T. Holliday, J. H. S. Blaxter, and Reuben Lasker, article, Journal of the Marine Biological Association of the United Kingdom, vol. 44, no. 3, Oct. 1964, pp. 711-723, illus., printed, single copy \$13.50. Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

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The Distribution and Migrations of Summer Spawning Herring in the Norwegian Sea, by K. A. Lyamin, Translation No. N. S. 50, 6 pp., illus., printed, 1964.

The Dynamics of the Biological Condition of the Atlanto-Scandian Herring during the Summer Period, by D. A. Shubnikov, Translation No. N. S. 46, 10 pp., illus., printed, 1964.

Features of the Distribution, Growth, and Maturation of Herring of Certain Year-Classes in the Barents Sea, by I. V. Shutova-Korzh, Translation No. N. S. 49, 10 pp., printed, 1964.

Migrations of the Atlanto-Scandian Herring, by Yu. Yu. Marti, Translation No. N. S. 45, 11 pp., illus., printed, 1964.

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Gujarat Fisheries Central Co-Operative Association, Ltd., Annual Report, 1962/63, 1 vol., printed. Gujarat Fisheries Central Co-Operative Association, Ltd., Ahmedabad, India.

INDUSTRIAL PRODUCTS:

Un Desafio a la Industria de Harinas y Aceites de Pescado en el Golfo de Mexico (A Challenge to the Fish Meal and Oil Industry of the Gulf of Mexico), by John W. Reintjes and Fred C. June, Serie: Trabajos de Divulgacion, vol. VIII, no. 75, 14 pp., processed in Spanish, Nov. 1963. (Translated from the English, Proceedings of the Gulf and Caribbean Fisheries Institute, Thirteenth Annual Session, Nov. 1960, pp. 62-66.) Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

"Price recovery registered in industrial fisheries product market," by Clarence F. Winchester, article, Fishing Gazette, vol. 81, no. 13 (1964 Annual Review Number), pp. 112, 114-115, 183, printed. Brown & Ross, Inc., 17 Battery Pl., New York, N. Y. 10004.

Photocopies of the following patents may be obtained from the International Association of Fish Meal Manufacturers, 70 Wigmore, St., London W1, England:

"Process of Manufacture and Sterilisation of Meat Meals and Fish Meals," by C. Jouandel and A. Duval, French Patent 1,313,225, printed in French, Nov. 19, 1964.

Process for Treating Oil-Containing Animal Material, such as Fish and Fish Offal, by H. M. Ehlert, United States Patent 3,041,174, printed in English, June 26, 1962.

Apparatus for Sterilising Fish Meal or Meat Meal, by R. Christiansen, German Patent 1,132,788, printed in German, July 5, 1962.

Process for Sterilising Fish Meal or Meat Meal, by R. Christiansen, German Patent 1,134,574, printed in German, Aug. 9, 1962.

Process for Solvent Recovery from the Miscella Obtained in the Extraction of Fish Pulp or Fish Meal with a Water-Soluble Organic Solvent, such as Ethyl Alcohol, by E. Fleming and R. Druger, German Patent 1,136,895, printed in German, Sept. 20, 1962.

Production of Fish Protein, by R. J. Moshy, Canadian Patent 663,559, printed in English and French, May 21, 1963.

INSPECTION:

Regulations Governing the Inspection of Canned Fish and Shellfish and the Operation of Canneries, 41 pp., processed, Oct. 1964. Department of Fisheries, Ottawa, Canada. These regulations, cited as the canned fish and shellfish inspection regulations, cover interpretation of terms, general provisions, labeling, chicken haddie or flaked fish, clams and mussels, crabs, finnan haddie, gaspereau, herring, lobster, mackerel, pollock, salmon (Atlantic), salmon (Pacific), sardines, shad, shrimp cocktail, and tuna. Requirements for each species are designated under fancy, standard, and commercial grades.

Regulations Respecting the Inspection of Processed Fish and Processing Establishments, 44 pp., processed, Oct. 1964. Department of Fisheries, Ottawa, Canada.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

These regulations, cited as the fish inspection regulations, cover interpretation of terms, general provisions, labeling, pickled fish, smoked fish, salted fish, fresh and frozen fish, smelts, oysters, scallops, breaded fish, and whitefish. Also included are Schedule A--requirements for pickled, marinated, salted, and smoked fish plants; Schedule B--construction and equipment requirements for fresh and frozen fish-processing establishments; Schedule C--operating requirements for fresh and frozen fish-processing establishments; and Schedule D--requirements for establishments storing frozen fish.

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Bulletin of the Faculty of Fisheries, Nagasaki University, no. 17, Sept. 1964, 144 pp., illus., printed in Japanese with English summaries. The Faculty of Fisheries, Nagasaki University, Nagasaki, Japan. "Studies on a marine viviparous teleost, *Ditrema temminckii* Bleeker. IV--On the origin of oocytes of *Ditrema temminckii*, *Sebastes marmoratus* and *Sebastes inermis*," by Kazuhiro Mizue; "Studies on the little toothed whales in the west sea area of Kyushu. X--About *Prodelphinus* sp. so-called 'Hashinaga-iruka' in Japan caught in the sea area around Goto Is., Nagasaki Pref.," by Kazuhiro Mizue, Kazumoto Yoshida, and Seizaburo Sonoda; "Analysis of fish-finder records. V--On winter shrimp trawl in the Yellow Sea (1)," by Deishi Shibata; "Freeze-preservation of *Porphyrha thalli* in viable state. I--Viability of *Porphyrha tenera* preserved at low temperature after freezing in the sea water and freezing under half-dried conditions; "Studies on *Penaeus orientalis* Kishinouye. I--Seminal mechanism and its function," by Masao Oka and Soichiro Shirahata; "Studies on the little toothed whales in the west sea area of Kyushu. XI--On the fatty alcohols of head oils from a porpoise and some dolphins," by Ryoiti Kanazu and Tadanobu Fukuhara; and "Studies on the decree of fishery-ground in Meiji," by Shigeshi Aotuka.

The Canners Journal, vol. 43, no. 10 (special statistical issue), 1964, 160 pp., illus., printed in Japanese. Japan Canners Association, Tokyo, Japan. Presents, in addition to articles of interest to the canning and food industries, statistical tables on shifts in production and exports of canned foods in Japan, 1954-63; shifts in consumption of canned foods, 1957-63; production of canned foods, actual and standard cases, 1948-55; exports of canned foods, actual and standard cases, 1948-55; and production of canned foods by kinds and can-types (round cans), Jan.-Dec. 1963. Also includes data on production of canned fishery products by prefectures, Jan.-Dec. 1963; exports of major canned foods by destinations, Jan.-Dec. 1963; exports and value of canned foods, 1959-63; wholesale prices of major marine products for 1963; catches of major fishery products, 1959-63; catches of whales, 1959-63; and production of tinplate by major Japanese manufacturers.

Japanese Fisheries Resource Conservation Association Major Activities in FY 1963, 24 pp., printed,

Oct. 1964. Japanese Fisheries Resource Conservation Association, c/o Futaba Bldg., 24, Nishikubo, Sakuragawa-cho, Minato-ku, Tokyo, Japan.

Statistic Tables of Fishing Vessels (as of the End of 1963), General Report No. 16, 309 pp., printed in Japanese and English. Japanese Fisheries Agency, Tokyo, Japan. An annual report containing statistical data in detail on the various types of Japanese fishing craft, both powered and nonpowered, as obtained by a fishery registration system.

The following issues are published by Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan:

Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, no. 7, July 1964, 75 pp., illus., printed in Japanese with English summaries. Contains, among others, articles on: "A transient glucosuria (Diabetes Mellitus) of rainbow-trout (*Salmo irideus*) induced by bovine growth hormone injection," by Yoshimasa Enomoto; "A preliminary experiment on the growth promoting effect of growth hormone with thyroid-stimulating hormone and prolactin to the young rainbow-trout (*Salmo irideus*)," by Yoshimasa Enomoto; "Studies on the oil pollution of the fishing ground in Seto Inland Sea. I--Distribution of oily wastes in the Sea," by Hitomi Sugimoto, Masaya Suzuki, and Osamu Takeuchi; "Frequency distribution of hauls by the Danish seiners in the Bristol Bay with respect to catch in tons," by Hiroshi Maeda and Shiro Minami; "On the cause of annual variation of fishing condition of big-eyed tuna in the area from Marshall Islands to Palmyra Island. VI--Relation between longline catch-rate and dominant age group and year the dominant age group was spawned," by Jun Nakagome; "Preparation of fatless fish meal by solvent extraction," by Kosaku Suzuki and Kuman Saruya; "Quality of Kombu, one of the edible seaweeds, belonging to the Laminariaceae. VIII--Conditions for extraction of total and amino-nitrogens with aqueous ethanol," by Ayako Okumura, Keiichi Oishi, and Kiichi Murata; and "A simple method for the determination of metmyoglobin content in tuna meat," by Kazuo Ando.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, no. 8, Aug. 1964, 120 pp., illus., printed in Japanese with English summaries. Includes, among others, these articles: "Granographical life record curve method for identifying each stock of pelagic fishes. VII--Identification of sardine stocks in coastal waters of Japan, 1938-48," by Hideaki Yasuda; "Egg development and prolarval stages of the turbot, *Pleuronichthys cornutus* (Temminck et Schlegel)," by Toru Takita and Shiro Fujita; and "Studies on fishing conditions of the dolphin, *Coryphaena hippurus* L., in the western regions of the Sea of Japan. IX--Quantitative analysis on stomach contents," by Shumpei Kojima; and "Distribution pattern of groundfishes hooked along a row of setline in the shallower part of the continental slope in the Bering Sea. III--Distribution near the outer edge of the continental shelf," by Hiroshi Maeda.

Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, no. 9, Sept. 1964, 95 pp., illus., printed in Japanese with English summaries. Includes, among others, these articles: "Studies on reproduction of rainbow trout, *Salmo gairdneri*, with special reference to egg taking. VI--The activities of spermatozoa

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in different diluents, and preservation of semen," by Minoru Nomura; "On the population and migration of adult red salmon in the western parts of the North Pacific and Bering Sea, as estimated by age composition," by Akira Ochiai and Toranosuke Yoshimitsu; "Studies on the propagation of abalone, *Haliotis diversicolor supertexta* Lischke. I--On the spawning habits," by Toshio Oba; "Studies on the antiseptics for agar during the manufacturing process in the mild winter. XI--On the causative bacteria on the 'Dankan' phenomenon, the spoilage of 'Tokoroten' and agar," by Hiroaki Fujisawa; "Studies on the behavior and the effect of some preservatives in fish products. I--Behavior of tylosin in fish products on the basis of antibacterial action," by Motonobu Yokoseki and others; "Distribution of *Vibrio parahaemolyticus* in plankton and fish in the open sea," by Susumu Horie and others; and "Denaturation of fish muscle proteins by freezing," by Taneko Suzuki.

KELP:

"Harvesting brown kelp--new industry for Tasmania," by P. C. Pownall, article, *Fisheries Newsletter*, vol. 23, no. 11, Nov. 1964, pp. 11, 13, 15, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia. Extensive beds of giant brown kelp (*Macrocystis pyrofera*), which a 1950 survey indicated could yield approximately 355,000 tons of wet weed a year, form the basis of a new alginates industry established on the East Coast of Tasmania. The kelp will be processed at a modern plant near the fishing port of Triabunna, and planned production is adequate to meet Australian requirements. Brown kelp is a natural source of sodium alginate (in its pure form a white powder) for which there is a world-wide demand. Alginates are used primarily in foods, pharmaceutical and cosmetic preparations, and in a variety of industrial products. Alginic acid is an unusual compound found only in brown seaweeds. It is used as a thickening agent in foodstuffs, medicines, and textile printing.

KOREA:

Korean Inspection Laws of Fishery Products (A Guide for Foreign Traders and Distributors), Inspection Service Series No. 1, 15 pp., illus., printed, 1964. Central Fisheries Inspection Station, Ministry of Agriculture and Forestry, 103 Wunnam-Dong, Congro-Ku, Seoul, Korea. Contains information on development of the Korean fishery products inspection system; types of inspection performed--continuous inspection, each piece inspection, and random sampling inspection; organization and functions of the Central Fisheries Inspection Station; text of the fishery products inspection law of 1962; other decrees and ordinances pertaining to fishery products inspection; and a copy of the inspection certificate.

LIVESTOCK NUTRITION:

"The nutrition of the early-weaned calf. VII--The relative value of four different fish meal products as the major protein source in the diet," by F. G. Whitelaw, T. R. Preston, and N. A. MacLeod, article, *News Summary*, no. 15, Sept. 1964, pp. 90-98, processed in English with French, German, and Spanish summaries, limited distribution. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

LOBSTERS:

"The economics of lobster fishing," by R. D. Leakey, article, *Fishing News*, no. 2688, Dec. 11, 1964, pp. 6, 7, illus., printed, single copy 9d. (about 15 U. S. cents). Arthur J. Heighway Publications Ltd., 110 Fleet St., London EC4, England. "The yardstick of efficient fishing is simply how much a lobster fisherman earns an hour for his effort... In terms of value for labor, therefore, it is more efficient to buy pots than to make them even when there is as big a difference as £2 (US\$5.60) to set against the bought pots... Incidentally, a pot for quick fishing must have a large, easy entrance--which all too often is also an easy exit... Slow moving shellfish are best caught profitably with a large number of pots left down for as long as the bait can be kept fresh and in place... Just how important the cost of your gear is in relation to time, is only appreciated when you work out how soon a lobster pot pays for itself in value of caught lobsters," states the author. He suggests the use of a power-driven pulley on the vessel to assist in servicing pots more rapidly and thus more economically.

"Quality changes in vacuum-packed and nonvacuum-packed frozen lobster meat during storage at different temperatures," by W. A. Murphy and H. L. Newson, *Canadian Fisheries Report*, no. 2, 1963, pp. 29-32, printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

A Study of the Hatching Process in Aquatic Invertebrates. XIII--Events of Eclosion in the American Lobster, HOMARUS AMERICANUS Milne-Edwards (Astacura, Homaridae), by Charles C. Davis, Contribution No. 2, 8 pp., illus., printed. (Reprinted from *The American Midland Naturalist*, vol. 72, no. 1, July 1964, pp. 203-210.) Division of Marine Fisheries, Massachusetts Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass.

MARINE AIDS:

Light List, Vol. III--Pacific Coast and Pacific Islands, 303 pp., illus., printed, 1964, \$2. U. S. Coast Guard, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Contains a list of lights, fog signals, buoys, daybeacons, lightships, radiobeacons, and loran stations for the Pacific Coast and Pacific Islands.

MARINE BORERS:

El Teredo (The Teredo), by Charles E. Lane, Serie: Trabajos de Divulgacion, vol. VIII, no. 76, 14 pp., illus., processed in Spanish, Nov. 1963. (Translated from the English, *Scientific American*, vol. 204, no. 2, Feb. 1961.) Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

MARINE ENGINES:

"Selection of marine engines under 50 hp.," by E. Kvaran, article, *Fishing News International*, vol. 3, Apr.-June 1964, pp. 48-59, printed. Arthur J. Heighway Publications, Ltd., Ludgate House, 110 Fleet St., London EC4, England.

MARINE MAMMALS:

Notas sobre Mamiferos Acuaticos (Notes on Aquatic Mammals), by Daniel Lluch Belda, Serie Trabajos de

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Divulgacion, vol. IX, no. 85, 10 pp., processed in Spanish, June 1964. Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

MASSACHUSETTS:

Following issued by Commonwealth of Massachusetts, Department of Natural Resources, Division of Marine Fisheries, 15 Ashburton Pl., Boston 8, Mass.:

Blueprint for Tomorrow, by Hal Lyman, 4 pp., illus., printed. (Reprinted from Salt Water Sportsman.) In Massachusetts, sport and commercial fisheries interests join forces to chart a modern approach to ancient problems.

Report Relative to the Coastal Wetlands in the Commonwealth, and Certain Shellfish Grants (under Chapter 75 of the Resolves of 1962), Document No. 635, 22 pp., printed, 1963.

Division of Marine Fisheries, Annual Report, Fiscal Year July 1, 1962-June 30, 1963, 74 pp., illus., processed, Sept. 1, 1963. Discusses accomplishments of the Division of Marine Fisheries during 1962/63 in marine fisheries administration; Marine Fisheries Advisory Commission; lobster fishery statistics; sea crab fishery; shore, net, and crab fishery; Massachusetts landings; commercial permits and certificates; sport fishing survey; and present status of proposed legislation affecting marine fisheries in 1963. Also covers research and management work in lobster research, lobster measurements, shellfish work, coastal wetlands study, finfish, estimate of the volume of alewife fishery, alewife propagation 1963, flounder tagging summary, and Newburyport Shellfish Purification Plant. In addition, covers shellfish production for 1962, summary of diggers, appraisal of coastal or marine engineering projects, sanitation program, detergents and cleansing agents approved by the Director of Marine Fisheries, and Estuarine research program. Also includes a progress report relative to the management of the black-back flounder fishery in Massachusetts.

General Laws Relating to Marine Fish and Fisheries, Chapter 130, As Amended Through 1963 (Special Laws on Trenching, Dragging and Other Marine Fisheries Subjects Not Included), 45 pp., printed. Includes State laws covered under general provisions; miscellaneous powers and duties of Director, coastal wardens, etc., pollution of coastal waters; riparian proprietors; regulation of fish weirs, nets, seines, trawls, and traps; annual reports of catches; smelt; lobsters, etc.; local control of shellfisheries; private shellfish grants; certain shellfish; shellfish in contaminated areas; purification plants; commercial permits and certificates; inspection of fish; herring, alewives, etc.; and miscellaneous provisions such as minimum length for fish taken from coastal waters.

Special Report of the Department of Natural Resources Relative to Restricting the Use of Beam or Otter Trawls, the Appointment, Powers and Duties of Shellfish Constables, the Control and Eradication of

Dogfish, the Taking of Lobsters, and the Enforcement of Certain Laws Relative to Fish by Local Police, Under Chapter 43 of the Resolves of 1963, 141 pp., illus., printed, 1964. Contains Minutes of the Marine Fisheries Advisory Commission Public Hearing, Gloucester, Mass., May 22, 1963; a report on a suit brought by the Commonwealth against defendants charged with violating the Acts which prohibit the use of otter trawls in certain parts of the territorial waters; study of the groundfisheries; value of groundfish caught during the study; silver hake study; the line trawl fishery study; report of dragging on bottom life and on the bottom; and report on the study area as the spawning and nursery grounds for species of sports and commercial importance. Also includes a study of the lobster fishery; proposed legislation relative to taking fish by otter trawl in certain coastal waters; statement submitted by Gloucester Fishermen's Cooperative Association pertaining to use of otter trawls; an Act authorizing and directing the Division of Marine Fisheries to establish and maintain a dogfish nuisance control and eradication program; an Act relative to the taking of lobsters; an Act permitting local police officers to enforce certain laws relative to fish and their authority in relation thereto; and an Act relative to the appointment of a shellfish constable or shellfish supervisor and his duties and powers.

MEXICO:

La Isla de Guadalupe, Mexico. Contribucion al Conocimiento de sus Recursos Naturales Renovables (The Island of Guadalupe, Mexico. Contribution to the Knowledge of Its Renewable Natural Resources), by Julio Berdegue A., 80 pp., illus., printed in Spanish, 1957. Direccion General de Pesca e Industrias Conexas, Secretaria de Marina, Mexico, D. F.

"Mexico's fisheries projects could mean Canadian sales," by J. E. G. Gibson, article, Foreign Trade, vol. 122, no. 7, Oct. 3, 1964, pp. 26-28, illus., printed, single copy 25 Canadian cents. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Millions of dollars are being spent on modernizing and expanding Mexico's fishing industry--much of it on new equipment that Canadian manufacturers could supply, according to the author. Mexico's plans to modernize its fisheries include: establishing marine biological research stations; exploring and charting the coastline; training workers in all aspects of the fishing industry; opening a fish meal plant at Alvarado late in 1964; providing loans for the fishing cooperatives to help them increase their fleets and improve their facilities; building a pilot fishing port on the Gulf of Mexico with a five-boat, all-purpose fleet, wharves and channels, processing plants, and research facilities; and sponsoring a travelling exhibition of the country's sea resources, the Salon del Mar, as part of a program to encourage Mexicans to eat more fish.

The following reports, processed in Spanish, are issued in the Serie: Trabajos de Divulgacion, and are available from the Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.:

Condiciones que guarda el aprovechamiento de los Recursos Pesqueros en los Estados de Tabasco, Chiapas y Porcion Istmica de Oaxaca y Veracruz (Conditions

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

which Assure the Utilization of the Fisheries Resources of the States of Tabasco, Chiapas, and the Isthmian Portion of Oaxaca and Veracruz), by Aurelio Solorzano P., vol. VIII, no. 72, 33 pp., illus., Oct. 1963.

Informe sobre la Situación Pesquera del Estado de Oaxaca. Apuntes para la Programación de ese Ren-glon Económico Estatal (Report on the Fishery Situation in the State of Oaxaca. Memoranda on the Planning of this item in the State Economy), by Aurelio Solorzano Preciado, vol. VIII, no. 74, 41 pp., Oct. 1963.

Investigaciones Pesqueras en el Pacífico (Fishery Investigations in the Pacific), by Cardenas Figueroa, vol. VII, no. 63, 38 pp., illus., June 1963.

Prospección Pesquera en Avión (Fishery Exploration by Airplane), by Héctor Chapa Saldana, vol. II, no. 20, 17 pp., illus., Oct. 1961.

Proyecto de Fomento Pesquero para Ayudar a la Rehabilitación Económica de la Tribu Seri (Fishery Development Project to Help in the Economic Rehabilitation of the Seri Tribe), by Rodolfo Ramirez Granados, vol. III, no. 26, 18 pp., June 1962.

Usion Biológico Pesquera y Conservación (Uses of Fishery Biology and Conservation), by Mauro Cardenas Figueroa, vol. VI, no. 56, 21 pp., May 1963.

MILT:

"Growth inhibitory effect of extracts from milt (testis) of different fishes and of pure protamines on micro-organisms," by Olaf R. Braekkan and Gjermund Bøge, article, Fiskeridirektoratets Skrifter Serie Teknologiske undersøkelser, vol. 4, no. 6, 1964, 22 pp., printed, Fiskeridirektoratet, Bergen, Norway.

MINK RATIONS:

"Feeding with herring waste. Trials on the use of herring waste in mink feeding," by K. S. Thomsen, article, Dansk Pelsdyravl, vol. 26, 1963, p. 431, printed in Danish, Dansk Pelsdyravl, Sdeasdy 8, Copenhagen, Denmark.

NORTHWEST ATLANTIC:

Las Pesquerías del Atlántico Noroeste y el Convenio de Washington (The Northwest Atlantic Fisheries and the Washington Convention), by Olegario Rodriguez, 103 pp., illus., printed in Spanish, Dec. 1961, Dirección General de Pesca Marítima, Subsecretaría de la Marina Mercante, Madrid, Spain.

NORTHWEST EUROPE:

Hayfisk og Fiskeri i Nordvesteuropa (Ocean Fish and Fisheries in Northwest Europe), by Bent J. Muus and Preben Dahlstrøm, 244 pp., illus., printed in Danish, Nov. 1964, hard cover 38.50 Kr., paperback 29.75 Kr. (about US\$5.60 and \$4.30). G. E. C. Gad, Vimmelskiftet 32, Copenhagen, Denmark. This beautifully illustrated and excellently written handbook on the fish of the Northeastern Atlantic Ocean is outstanding in the field of popular, semitechnical reference books. Despite the fact it is written in Danish, the illustrations of the fish, their food, their habitat, the gear with which they are taken, and the commercial uses to which the fish are put, are so

colorful and clear that any non-Danish reader will get full value for his money, even in the illustrations alone. The accompanying text discusses, in simple terms, the life histories of the fish, where and how they are caught, and many other interesting facts.

The pocket-size book contains illustrations in 6 colors of 173 species of fish. In most instances the large illustration of the mature fish is surrounded by smaller sketches in color of its special characteristics, younger stages, most important food, and the area it inhabits. Also included are the various types of gear and vessels used in its capture, and the end result--an iced, frozen, salted, smoked, canned or otherwise processed or preserved product. The small sketches alone number over 800.

There are nine brief illustrated chapters or sections in addition to the 179 pages devoted to the "Descriptions and Illustrations" of fish. "Portrait of a Fish" describes the skin, scales, organs, senses, colors, form, and swimming. "The Fish's Life" includes schooling, migrations, spawning, development, growth, age, food, plankton and food chains, habitat, and hydrography. "Keys" to the more important groups are so clearly illustrated that identifying a fish belonging to these groups is a simple matter. "History of the Fisheries" briefly touches upon significant events from ancient times to the present. "Fishing Methods" depicts and describes all of the significant types of gear (including a powerblock and an air-bubble curtain) and present day fishing vessels and their electronic equipment. "Utilization of the Fish" explains the usual processing techniques. "Fishery Biology" touches on determination of age and growth, food research, tagging, races and stocks, recruitment, and assessment. "Name Index" includes two alphabetical lists (one of fish names in Danish and one in Latin). "Literature Reference" lists one Swedish, one Norwegian, and three Danish works on fisheries.

The author, Bent Muus, is a biologist at Denmark's Fisheries and Marine Research Institute at Charlottenlund, just north of Copenhagen. The illustrator, Preben Dahlstrøm, has illustrated a number of natural history books. Together they have turned out a work which is an unusual combination of popular appeal, technical information, and the printer's art. It should rank high as a Danish contribution to fishery books.

--A. W. Anderson

NUTRITION:

"The effect of a supplementary protein food containing fish flour, groundnut flour and Bengal gram flour and fortified with vitamins on the growth and nutritional status of children," by T. R. Doraiswamy and others, article, Indian Journal of Pediatrics, vol. 30, 1963, p. 266, printed, Indian Pediatric Society, 56/2 Creek Row, Calcutta, India.

OCEANOGRAPHIC EQUIPMENT:

"A hydraulically actuated safety device," by Peter L. Sachs, article, Journal of Marine Research, vol. 22, no. 1, 1964, pp. 105-109, illus., printed, Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn. Reduces accidental premature operation of oceanographic samplers.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

OCEANOGRAPHY:

A Bibliography of Articles Pertinent to Marine Primary Productivity, compiled by Maxwell S. Doty, TID-3913, 31 pp., processed, Oct. 1963, 75 cents. Division of Technical Information, U. S. Atomic Energy Commission, Washington, D. C. (For sale by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.)

"Flip: an oceanographic buoy," by Philip Rudnick, article, *Science*, vol. 146, no. 3649, Dec. 4, 1964, pp. 1268-1273, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Discusses in detail the construction and functions of the large manned spar buoy "Flip" (Floating Instrument Platform) used by the Scripps Institution of Oceanography. Reasonably mobile, it is towable in the horizontal position. When vertical it is an acoustically quiet platform of great stability extending simultaneously to 90 meters below and 17 meters above the sea surface. Once "Flip" was planned, it was evident that she would have important uses beyond the initial project not only for instrumental investigations of the uppermost 90-meter layer of the ocean, but as a more nearly stationary support from which to lower instruments by cable into the deeper layers. The hull, 315 feet (95 meters) long, is joined to a boxlike structure which serves as a bow when the buoy is horizontal and as a superstructure when it is vertical. The superstructure contains, in addition to fuel and freshwater tanks, four compartments which are used in both horizontal and vertical positions and constitute the inhabited part of the buoy. Power for the two air compressors is supplied by two 60 kw. diesel-driven generators. The buoy has no self-propulsion, but is fitted with two propellers mounted near the center of the hull and driven by hydraulic motors which maintain it in any desired position. "Flip" is manned by a crew of seven. Most work thus far has involved her response to wave action.

Oceanographic Cruise USCGC NORTHWIND, Bering & Chukchi Seas, July-Sept. 1962, Oceanographic Report No. 1, CG 373-1, 111 pp., illus., printed, 1964, \$1.50. U. S. Coast Guard, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

Oceanographic Observations, North Atlantic Ocean Station Delta, 44°N. 41°W., March-Apr. 1963, by J. W. McGary and R. M. Morse, Oceanographic Report No. 3, CG 373-3, 35 pp., illus., printed, 1964. U. S. Coast Guard, Washington, D. C.

Oceanographic Observations - North Atlantic Ocean Station Echo, 35°N. 48°W., Jan.-Feb. 1963, by R. M. Morse and J. W. McGary, Oceanographic Report No. 2, CG 373-2, 36 pp., illus., printed, 1964. U. S. Coast Guard, Washington, D. C.

"Oceanography: cost-effectiveness technique employed to support case for basic research program," by D. S. Greenberg, article, *Science*, vol. 146, no. 3652, Dec. 25, 1964, pp. 1659-1660, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Discusses a report by the

Committee on Oceanography of the National Academy of Sciences-National Research Council supporting the thesis that oceanographic research can be expected to produce an attractive economic return. It concludes that an annual nondefense expenditure of \$165 million over the next 10 to 15 years (the current figure is \$138 million) could be essential in saving \$3 billion a year (principally through conservation practices) and in adding annual production of about another \$3 billion. To reach this conclusion, the committee not only took up the obvious matter of fish and minerals; it went even farther afield and estimated that oceanography's contributions to weather forecasting could produce substantial savings for cattle and hog producers.

Oceanography and Marine Biology: an Annual Review, vol. 2, edited by Harold Barnes, 548 pp., printed, 1964, 75s. (about US\$10.50). George Allen and Unwin, Ltd., 40 Museum St., London WC1, England.

Second Annual Report, 1963, 16 pp., printed, 1963. Canadian Oceanographic Data Centre, Ottawa, Canada.

OCEAN PERCH:

The following articles are from *Rybnoe Khoziaistvo*, 1962. *Rybnoe Khoziaistvo*, V. Krasnosel'skaia 17, B-140, Moscow, U.S.S.R.

"O gruppirovkakh okunya-klyuvacha (*Sebastes mentella* Travin) v Labradorsko-N'yufaundlenskom raione" (On the stocks of deepwater redfish--*Sebastes mentella*--in the Labrador-Newfoundland region), by K. P. Yanulov, pp. 285-296, printed in Russian with English summary.

"Razmerno-vozzrastnoi sostav okunyaklyuvacha Severo-Zapadnoi Atlantiki" (Size and age composition of *Sebastes mentella* Travin of the northwestern Atlantic), by E. I. Surkova, pp. 297-311, printed in Russian with English summary.

OYSTERS:

"Louisiana leads in oyster production!" by Lyle St. Amant, article, *Louisiana Conservationist*, vol. 17, nos. 1 & 2, Jan.-Feb. 1965, pp. 14-17, illus., printed, *Louisiana Conservationist*, Wild Life & Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. Louisiana produced 20 percent of all the oysters in the United States in 1963, placing her in the number one position. However total production in the United States was down by 11 percent during the five-year period 1959-63. Louisiana has a large oyster-growing area with mostly optimum characteristics for oyster production, but faces many problems in this industry. Predators, pollution, and high salinity are grave dangers to this mollusk. Culture from seed oysters is practiced in many areas. Rapid growth of oysters in warm waters makes it possible for the oysterman to plant seed oysters in the fall and harvest them in the spring.

"Total solids in oysters," by Norman W. Durrant, article, *Journal of the Association of Official Agricultural Chemists*, vol. 46, Aug. 1963, pp. 744-746, printed, Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C. 20004.

PACKAGING:

A New Device for Testing the Airtightness of Fish Preserve Packaging, by L. M. Kazakov, Translation No.

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I-4193, 5 pp., printed. (Translated from the Russian, *Rybnoye Khozyaystvo*, vol. 37, no. 1, 1961.) Headquarters, Dept. of the Army, Office, Assistant Chief of Staff for Intelligence, Washington 25, D. C.

"Packaging requirements for irradiated fishery products," by Louis J. Ronsivalli and John A. Peters, article, *Fishing Gazette*, vol. 81, no. 13 (1964 Annual Review Number), pp. 134, 136, 138, printed. Brown & Ross, Inc., 17 Battery Pl., New York, N. Y. 10004.

PARASITES:

A Second List of Parasites from Marine and Coastal Animals of Florida, by Robert F. Hutton, 9 pp., printed, 1964. (Reprinted from *Transaction of the American Microscopical Society*, vol. 83, no. 4, 1964, pp. 439-447.) American Microscopical Society, 50 E. Broad St., Columbus, Ohio.

PITUITARY GLAND:

The Pituitary Gland and Its Relation to the Reproduction of Fishes in Nature and in Captivity, An Annotated Bibliography for the Years 1956-1963, compiled by James W. Atz and Grace E. Pickford, *Fisheries Biology Technical Paper No. 37*, 65 pp., processed in English with French and Spanish introductions, Apr. 1964. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

PLANKTON:

Apuntes Preliminares sobre Tecnicas Planctonologicas (Preliminary Memoranda on Planktonological Techniques), by Maria Luisa Sevilla, Publicacion No. 9, 30 pp., illus., printed in Spanish, 1964. Instituto Nacional de Investigaciones Biologicas Pesqueras, Comision Nacional Consultiva de Pesca, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

POLAND:

"Sea Fishing Act" (*Ustawa o Rybolowstwie Morskim*), 21 May 1963; *Dziennik Ustaw Polskiej Rzeczypospolitej Ludowej* No. 22, 28 May 1963, p. 270, Text 115, Food and Agricultural Legislation, vol. XIII, no. 1, Sept. 1964, Poland, XVI/3, 10 pp., printed, single copy \$1. Columbia University Press, International Documents Service, 2960 Broadway, New York, N. Y. 10027. Contains general provisions such as area covered, restriction of fishing to Polish vessels, and definitions; fishing authorizations covering issuance of permission to fish; registration and designation of fishing vessels and gear; observance of fishing orders covering safety measures; fisheries protection covering conservation practices; fisheries supervision including enforcement; penal provisions comprising fines and other sentences for violations; and final provisions including repeal of prior laws.

"Statki rybackie dla malych portow Polskiego wybrzeza. Czesc III" (Fishing vessels for Poland's small fishing harbors. Part III), by Bohdan Pradzynski, article, *Bodownictwo Okretowe*, vol. 9, no. 11, Nov. 1964, pp. 382-384, illus., printed in Polish with English summary. Wydawnictwa Czasopism, Technicznych NOT, Czackiego 3/5, Warsaw, Poland. Parts I and II discussed the traditional types of fishing vessels. This part deals with tuna boats and catch-

er-trawlers. The author visualizes a tuna boat with Poland's small harbors as base ports. The tuna boat discussed is in part patterned after the modern French tuna vessel.

POLLUTION:

Contaminacion de las Aguas y Otras Alteraciones Ambientales que Afectan Nocivamente a los Organismos Acuaticos (Contamination of the Waters and Other Environmental Changes which Adversely Affect Aquatic Organisms), by Felipe Brizuela A., Serie: *Trabajos de Divulgacion*, vol. VII, no. 62, 22 pp., processed in Spanish, Aug. 1963. Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

PORTUGAL:

"Portugal: evolucion de las pescas en 1963. I"; "II" (Portugal: development of the fisheries in 1963. I; II), articles, *Industrias Pesqueras*, vol. 38, no. 894, July 15, 1964, pp. 328-329; no. 895, Aug. 1, 1964, pp. 348-350, illus., printed in Spanish, single copy 50 ptas. (about 85 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21 - 2º, Vigo, Spain.

POULTRY NUTRITION:

The following articles are from *News Summary*, no. 15, Sept. 1964, processed in English with French, German, and Spanish summaries, limited distribution. International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England:

"The protein requirements of laying hens," by J. R. Couch, pp. 77-81.

"Response to fish meal in laying hen diets," by J. H. Quisenberry, pp. 65-77.

POULTRY RATIONS:

"The influence of solvent-extracted fish meal, stabilized fish oil and texture of corn in broiler rations," by J. O. Hardin and J. L. Milligan, article, *Poultry Science*, vol. 42, 1963, p. 1275, printed. Poultry Science Association, Kansas State College, Manhattan, Kans.

QUALITY:

"Liquor loss as an index to fish texture," by W. T. Little and R. H. Smithies, article, *Chemistry and Industry*, no. 29, July 18, 1964, pp. 1293-1295, printed. Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

REFRIGERATION:

"Refrigeration for small fishing vessels," by A. C. Blain, article, *Fisheries Newsletter*, vol. 23, no. 10, Oct. 1964, pp. 23-25, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia. This is the first of two articles describing some of the methods of refrigeration suitable for small vessels in the 30-foot to 50-foot range, particularly those where no provision has been made for refrigeration equipment. Installation of refrigeration equipment in existing vessels creates two problems: (1) space for equipment; and (2) allowance for displacement. The basic requirement for any refrigerated hold is good insulation. It has been found that if the hold is piped on the basis of 1½ cubic feet of hold space for each lineal foot of 1-inch diameter refrigeration pipe (or

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in the same ratio with other size pipes) and the compressor and condenser balanced against the piping, a satisfactory system results. Brine-freezing of crustaceans has been found to be the more rapid and economical method for smaller vessels, as salt penetration is not as marked as it is for trawl fish immersed in brine solution. It is preferable to operate the equipment prior to loading to ensure a cold reserve when the product first enters the freezer. Agitated or circulated brine will increase efficiency considerably.

SAFETY:

"Avoiding accidents on deck," article, *World Fishing*, vol. 13, July 1964, pp. 72, 75, printed, John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

SALMON:

Effect of the March 27, 1964 Earthquake on Pink Salmon Alevin Survival in Prince William Sound Spawning Streams, by Wallace H. Noerenberg, Informational Leaflet No. 43, 10 pp., processed, 1964. Department of Fish and Game, Subport Bldg., Juneau, Alaska.

The Fourth Annual Johnson Strait Report on the Status of the Even Year Pink Salmon Stocks and of the Chum Salmon Stocks of the Johnson Strait Study Area and on the Prospects for 1964, 43 pp., printed, 1964. Department of Fisheries, Pacific Area, Vancouver, B. C., Canada.

"Lipids of salmonoid fish. III--Acetone-soluble lipid from muscle of *Oncorhynchus keta*," by Mutsuo Hatanoto and others, article, *Chemical Abstracts*, vol. 58, Mar. 4, 1963, abstract no. 4841e, printed, American Chemical Society, 1155 16th St., NW., Washington, D. C. 20006.

Research Briefs, vol. 10, no. 1, June 1964, 74 pp., illus., printed. Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Ore. 97015. Contains, among others, these articles: "Analysis of average-weight sampling of commercial catches of Columbia River chinook salmon," by Earl F. Pulford; "Fecundity of Columbia River chinook salmon," by James L. Galbreath, and Richard L. Ridenhour; "The effect of confinement on blood lactate levels in chinook and coho salmon," by Robert J. Ellis; "Ranking of wet ingredients for Oregon pellets," by John W. Westgate, Thomas B. McKee, and Duncan K. Law; "Experiments with repeated spawning ground counts of coho salmon in three Oregon streams," by Raymond A. Willis; "A modified method of analyzing stomach contents with notes on the food habits of coho salmon in the coastal waters of Oregon and Southern Washington," by Paul E. Reimers; and "Occurrence of juvenile salmon in stomachs of adult coho salmon," by Richard L. Angstrom and Paul E. Reimers.

The following articles are from *Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoziaistva i Okeanografii*, vol. 48, 1962. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010,:

"O primenenii vital'nogo okrashivaniya mal'kov tikhookeanskikh lososei dlya ikh kolichestvennogo ucheta" (Use of a vital stain for marking Pacific Ocean

salmon young for their quantitative censusing), by V. Ya. Levanidov, pp. 206-207, printed in Russian.

"Zapasy amurskikh kososei in gidrostroitel'stvo" (Stocks of Amur salmon and hydroelectric construction), by V. Ya. Levanidov, pp. 133-140, printed in Russian.

The following articles, printed in Russian, are from *Referativnii Zhurnal-Biologiya*, 1963, Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.:

"Khod gorbushi v reku Volongu" (Run of pink salmon in the Volonga River), by L. A. Danilenko, No. 8154.

"Metodika i ruzul'taty mecheniya val'chakov semgi v r. Varzuga v 1958-1959 gg." (Procedure and results of tagging salmon kelts in the Varzuga River in 1958-1959), by M. N. Mel'nikova, No. 819.

"Vyrashchivanie molodi lososya na iskusstvennom korme KRT-III" (Rearing young salmon on the artificial food KRT-III), by E. M. Malikova, No. 12176.

"Vyrashchivanie zhivyykh kormov v prudakh dlya molodi lososya pri nizkikh temperaturakh" (Raising live food in ponds for young of salmon at low temperatures), by M. M. Isakova-Keo, No. 35245.

SALMON AND STEELHEAD:

Oregon Coastal Salmon and Steelhead Tagging Programs, Part I--Tillamook Bay, 1953, by Kenneth A. Henry; Part II--Siletz River, 1954, by Alfred R. Morgan, Contribution No. 28, 62 pp., illus., printed, May 1964. Oregon Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Ore. 97015.

SALTED FISH:

Review of Salted Fish Production and the European Markets, 1963-64 Season, 58 pp., printed, 1964. Hawes and Company (London) Ltd., London, England.

SCALLOPS:

The Scallop Fishery of Massachusetts (Including an Account of the Natural History of the Common Scallop), by David L. Belding, Marine Fisheries Series--No. 3, Contribution No. 13, 57 pp., illus., reprinted, 1964, 40 cents. Division of Marine Fisheries, Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass. The scallop differs from the clam, oyster, and quahaug in that it has more rapid growth, a shorter life, is less likely to transmit disease if taken from contaminated waters, and is less adapted to cultivation. Part I, covering natural history of the scallop, discusses its anatomy, early life history, habits, and growth. Part II, encompassing the scallop fishery, presents information on the fishing grounds, the industry, laws concerning scallops, and methods of improving the scallop industry.

SCOTLAND:

Scottish Fisheries Bulletin, no. 21, June 1964, 28 pp., illus., printed, Department of Fisheries for Scotland, Edinburgh, Scotland. Includes, among others, articles on: "Forecast for Scottish North Sea and West Coast herring fisheries in 1964," by B. B. Parrish and A. Saville; "Artificial hatching and rearing of lobsters--a review," by H. J. Thomas; "Herring trawling off the West Coast of Scotland," by I. G. Baxter; "The

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sprat fishery," by Alan Saville; and "Scallops in Scotland," by Bennet B. Rae.

SEALS:

"The use of electric current in catching seals," by B. I. Badamshin, V. N. Lukashev, and A. Kh. Pateyev, article, General Studies on the Fishing Industry, USSR, JPRS 25, 581, pp. 17-24, processed, July 24, 1964, \$3. (Translated from the Russian, Rybnoe Khozyaistvo, no. 4, April 1964, pp. 51-55.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

SEAWEED:

Proceedings of the 4th International Seaweed Symposium, Biarritz; September 1961, edited by Ad. Davy de Virville and J. Feldmann, 490 pp., printed, 1964, £5 (about US\$14). Pergamon Press, 122 E. 55th St., New York, N. Y. 10022.

SHAD:

"Mesta i usloviya neresta sel'dei roda Alosa v Severnom Kaspii v 1934-1937 gg." (Localities and conditions of spawning of shad of the genus Alosa in the North Caspian Sea in 1934-37), by T. A. Pertseva-Ostroumova, article, Trudy Instituta Okeanologii, Akademiia Nauk SSSR, vol. 62, 1963, pp. 28-48, printed in Russian with English summary. Trudy Instituta Okeanologii, Akademiia Nauk SSSR, Moscow, U.S.S.R.

SHARKS:

Aspectos Interesantes para la Pesca de Tiburon en Mexico (Interesting Aspects of the Shark Fishery in Mexico), by Victoria Marin A., Serie: Trabajos de Divulgacion, vol. IX, no. 88, 26 pp., illus., processed in Spanish, July 1964. Departamento de Estudios Biologico Pesqueros, Direccion General de Pesca e Industria Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

Feeding Behavior in Three Species of Sharks, by Edmund S. Hobson, Contribution No. 180, 24 pp., illus., printed. (Reprinted from Pacific Science, vol. 17, no. 2, Apr. 1963, pp. 171-194.) Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii.

A Revision of the Carcharhinid Shark Genera SCOLI-ODON, LOXODON, and RHIZOPRIONODON, by Victor G. Springer, Proceedings of the United States National Museum, Smithsonian Institution, Washington, D. C., vol. 115, no. 3493, 1964, pp. 559-632, printed. U. S. National Museum, Washington, D. C. 20560.

Sharks and Survival. Chapter 8--Olfaction, Gustation, and the Common Chemical Sense in Sharks, by Albert L. Tester, Contribution No. 188, 28 pp., illus., printed. (Reprinted from Sharks and Survival; pp. 255-282. Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii.

SHELLFISH CULTURE:

"Artificial cultivation of clams, oysters proved practical in N. C. (North Carolina) laboratory," by Bob Simpson, article, National Fisherman/Maine Coast Fisherman, vol. 45, Aug. 1964, p. 13, printed. Journal Publishing Co., Belfast, Maine.

SHRIMP:

"Gefriertrocknung soll Deutschen krabbenfishern helfen" (Freeze-drying must help German shrimp fishermen), article, Ties Kuhlketten, vol. 8, no. 95, Nov. 1963, p. 28, printed in German. H. E. Albrecht Verlag KG., Freihamerstrasse No. 2, Munich T. Germany.

General Information about Canned Shrimp, 4 pp., illus., processed, Aug. 1964. Robinson Canning Co., Inc., P. O. Box 4248, New Orleans, La. 70118. Discusses briefly types of canned shrimp--wet or dry pack; style--regular or deveined pack; sizes--broken, tiny, small, medium, large, jumbo, and colossal; inspection in plants during and following World War II; can sizes--4½-oz. and 5 oz.; equivalent can contents in terms of fresh raw shrimp; private label buyers; packaging and shipping, and shipping data; and routing of shipments.

"A note on the prawn fishery of Kutch," by S. Ramamurthy, article, Journal of the Marine Biological Association of India, vol. 5, no. 1, 1963, pp. 146-148, printed. Marine Biological Association of India, Marine Fisheries, P. O., Ramanathapuram Dist., South India.

Radiation Pasteurization of Shrimp. Final Summary Report for the Period January-December 1962, by Arthur F. Novak and J. A. Liuzzo, ORO-601, 1 vol., illus., printed. Division of Technical Information, U. S. Atomic Energy Commission, Washington, D. C. 20545.

"Rapid method for determination of moisture in freeze-dehydrated shrimp," by J. E. Despaul and D. W. Ezer-ski, article, Journal of the Association of Official Agricultural Chemists, vol. 46, no. 6, 1963, pp. 1001-1003, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C. 20004.

"What future trading means to the U. S. shrimp industry," article, Fish Boat, vol. 9, Aug. 1964, pp. 23-24, 37-40, printed. H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.

SMALL BUSINESS MANAGEMENT:

The following reports are published by Small Business Administration, Washington, D. C. 20416:

Cost Reduction in Small Manufacturing Plants, by E. C. Keachie, Management Research Summary, 4 pp., illus., processed, 1964. Unit manufacturing costs decrease in a special way not revealed by traditional techniques for estimating costs--rapidly at first, and then at a diminishing but predictable rate. Improvement takes place according to a simple relation that can be charted as the "learning curve"; the same percent of increase in productivity takes place every time the total production doubles. The learning curve can be a prime tool of small manufacturers in cost reduction and control. Those who used it in connection with this study reported improvement in productivity, methods and product design, lot sizing, worker aptitudes, checking bids, and promptness in meeting delivery dates.

Operations Research for Small Business, by John E. Hosford, Technical Aid for Small Manufacturers No. 89, 4 pp., processed, Nov. 1964. Operations research (OR) is a technique which uses various fields of knowledge--such as mathematics, chemistry, and other

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sciences--to solve industrial problems. For example, OR uses mathematics to examine various possible solutions to problems such as inventory, warehousing, transportation, resource allocating, and scheduling. In examining alternatives, OR does two things: (1) defines and clarifies the operational problem, and (2) predicts what will happen if any particular part of the operation is changed. This leaflet explains how operations research is used and describes several of its basic tools, such as queueing, linear programming, dynamic programming, and simulation.

Tax Guide for Small Business, 1965, Publication No. 334, 160 pp., illus., printed, 1964, 50 cents. Internal Revenue Service, U. S. Treasury Department, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A guide for use in filing the 1964 income tax returns, excise tax returns, and other returns for 1965. Answers the Federal tax questions of corporations, partnerships, and sole proprietorships. Explains in plain layman's language the tax results from buying, starting, operating, and the sale and other disposition of a business. In addition, contains a tax calendar for 1965 which should prove helpful to the businessman throughout the year, since it indicates what he should do and when he should do it in regard to the various Federal taxes. Also has a checklist of special interest for the man just starting in business in that it affords a quick method of determining for what Federal taxes he may be liable. This edition has been brought up to date and includes explanations of the provisions of the new tax law, as they affect businessmen. Some of the changes discussed are new lower rates, income averaging, travel expense rules, interest on certain deferred payments, and disposition of depreciable property.

SMOKING:

"Improving the traditional method of smoking," article, Fisheries Research Report, vol. 1, no. 1, 1962, pp. 8-11, printed, Fisheries Inspectorate Unit, Accra, Ghana.

SOUTH AFRICA REPUBLIC:

The Fishing Industry of South and South West Africa, (supplement to the Standard Bank Review), by Peter Hjul, 15 pp., illus., printed, November 1964. The Standard Bank of South Africa Limited, Cape Town, Republic of South Africa. This attractively color-illustrated booklet discusses the growth of the fishing industry from a catch of 20 million metric tons a year immediately after World War II to 45 million metric tons in 1962; research by the Government's Division of Sea Fisheries; species landed, such as hake, spiny lobster, tuna, maasbanker, mackerel, and pilchard; and the quota system for landings by the various factories. Also covered are production and marketing of canned fish and fish meal; production techniques for fish meal, fish oil, and canned fish; plans for the future by the Fisheries Development Corporation; protection, landings, and exports of spiny lobsters; increase in number of trawlers and production of quick-frozen fillets and fish sticks; and fishing by vessels of Russia, Poland, Japan, and Spain off the coasts of South and South West Africa.

Index to the Publications of the Fishing Industry Research Institute, January 1947-June 1963, compiled by C. R. Houba, 97 pp., processed, 1964. Fishing Industry Research Institute, University of Cape Town, Cape Town, Republic of South Africa.

The South African Fishing Industry Handbook and Buyers' Guide, 1964/65 (Seventh Edition), 320 pp., illus., printed, R4.20 (about US\$5.90). Thomson Newspapers, South Africa (Pty.) Ltd., Box 80, Cape Town, Republic of South Africa. This edition of the handbook reviews the progress of the South African and South-West African fishing industry during 1963 and 1964 and gives details of the catch and production of fishery products. Included is information on recent developments in the fishing industry; fish-processing factories; fish and shellfish landings; South African fish species; legal minimum size limits of South African fish; and organizations serving the industry. Also lists the leading personalities in the industry; South and South-West African fishing companies; distributors of fresh and frozen fish; producers of processed fish; suppliers to the fishing industry; regulations for fishing vessels, motor vessels, trawlers, and steam trawlers; types of marine engines; and suppliers of fuels and lubricants. An excellent guide for anyone interested in the South and South-West Africa fisheries.

SOUTH AMERICA:

Anuario de Pesca, 1963/1964 (Fisheries Yearbook, 1963/1964), 130 pp., illus., printed in Spanish, \$7. Ediciones Sudamerica S. A., Av. Wilson 911, Oficina 301, Apartado 877, Lima, Peru. Includes articles on: "Urge mejorar puertos" (It is urgent to improve ports); "Conservas: crisis que perdura" (Canning industry: a crisis that continues); "Hay que pescar para todos" (There is fishing for all); "Harina de pescado: perspectivas ilimitadas" (Fish flour: unlimited prospects); "Tributación en Chile y Peru" (Taxation in Chile and Peru), by M. Bapalu; "Sigue subiendo producción de harina y aceite de pescado" (There follows a rising production of fish meal and oil); "Productores Pesqueros del Peru" (Peruvian fishing firms); and "Proveedores de la pesquería" (Suppliers for the fishing industry).

SPAIN:

Estadística de Pesca, 1963 (Fishery Statistics, 1963), 646 pp., illus., printed in Spanish, Aug. 1964. Dirección General de Pesca Marítima, Ministerio de Comercio, Madrid, Spain.

SPINY LOBSTERS:

Ensayo de Nasas para Langosta en la Bahía de la Ascension, Quintana Roo, Mexico (Experiment with Traps for Spiny Lobsters in La Ascension Bay, Quintana Roo, Mexico), by Manuel J. Solis Ramirez, Serie: Trabajos de Divulgación, vol. VII, no. 66, 19 pp., illus., processed in Spanish, July 1963. Departamento de Estudios Biológicos Pesqueros, Dirección General de Pesca e Industrias Conexas, Secretaría de Industria y Comercio, Mexico, D. F.

SPONGES:

A Revision of the Classification of the Calcareous Sponges (with a Catalogue of the Specimens in the British Museum), by Maurice Burton, 698 pp., printed, 1963, 300s. (about US\$42.00). British Museum (Natural History), London WC1, England.

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STARFISH:

"Spawning of starfish: action of gamete-shedding substance obtained from radial nerves," by Haruo Kanatani, article, *Science*, vol. 146, no. 3648, Nov. 27, 1964, pp. 1177-1179, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

STERN TRAWLERS:

"Badania modelowe nad okiersleniem wlasnosci napedowych i manewrowych trawlerow rufowych ze sterem normalnym oraz z obrotowa dysza Korty" (Model testing for the determination of propulsion and maneuver properties of stern trawlers with a normal rudder and rotary Kort nozzle), by G. Hahnel, article, *Bodownictwo Okretowe*, vol. 9, no. 11, Nov. 1964, pp. 385-390, illus., printed in Polish. Wydawnictwa Czasopism, Technicznych NOT, Czackiego 3/5, Warsaw, Poland.

STRIPED BASS:

The Striped Bass in Massachusetts, by George C. Matthiessen, 21 pp., illus., printed, Department of Natural Resources, Division of Marine Fisheries, 15 Ashburton Pl., Boston 8, Mass.

STURGEON:

"Sostav stada i razmnozhenie osetra na Volge nizhe Volzhskoi GES imeni Lenina" (Composition of the stock and reproduction of Russian sturgeon on the Volga below the Lenin Hydroelectric Station), by A. T. Dyuzhikov, article, *Referativnii Zhurnal-Biologiya*, 1963, No. 8144, printed in Russian. Akademiia Nauk SSSR, Nauchnoi-Informatsii, Moscow, U.S.S.R.

SUBMARINES FOR RESEARCH:

"Biologicheskie issledovaniya, provedennye na podvodnoi lodke 'Severyanka'" (Biological studies conducted on the submarine *Severyanka*), by M. I. Ryzhenko, article, *Trudy Okeanograficheskoi Komissii, Akademiia Nauk SSSR*, vol. 14, 1962, pp. 95-102, printed in Russian. *Trudy Okeanograficheskoi Komissii, Akademii Nauk SSSR*, Moscow, U.S.S.R.

TAGGING:

"A comparison of spaghetti and Petersen tags used on steelhead trout at Gnat Creek, Oregon," by Thomas E. Kruse, article, *Research Briefs*, vol. 10, no. 1, June 1964, pp. 57-66, illus., printed, Fish Commission Research Laboratory, Route 1, Box 31A, Clackamas, Ore. 97015.

TECHNOLOGY:

"Fish technology in Britain," by G. H. O. Burgess, article, *Chemistry and Industry*, no. 29, July 18, 1964, pp. 1293-1295, printed, Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

TILAPIA:

"Metody razvedeniya tilypii v Demokraticheskoi Respublike V'etnam" (Methods of rearing tilapia in the Democratic Republic of Viet-Nam), by Kong T'Am Chang, article, *Referativnii Zhurnal-Biologiya*, 1963, Abstract No. 12187, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

TOXICITY:

Fish Poisoning in Hawaii, by Philip Helfrich, Contribution No. 186, 18 pp., illus., printed. (Reprinted

from the *Hawaii Medical Journal*, vol. 22, May-June 1963, pp. 361-372.) Hawaii Marine Laboratory, University of Hawaii, Honolulu, Hawaii. Fish poisoning has affected more than 433 persons in over 54 recorded outbreaks in Hawaii since 1900, according to this study. Of the four categories of poisoning reported in Hawaii (ciguatera, hallucinatory mullet poisoning, tetraodon or puffer fish poisoning, and scombroid or histamine poisoning), only poisoning by the puffer fish has caused death--seven of them. Gymnotherax (moray), elasmobranch (shark), and clupeid (herring) poisoning have not been recorded in Hawaii. Ciguatera, caused by a neurotoxic substance, is the most serious hazard of all; it is a recent affliction in Hawaii, difficult to predict or control, and produced by many species of fish that are highly esteemed as food; and the toxin seems to have a cumulative effect.

TROUT AND SALMON:

El Cultivo de la Trucha y del Salmon. La Nutricion (The Culture of Trout and Salmon. Nutrition), by Earl Leitritz, Serie: *Trabajos de Divulgacion*, vol. VIII, no. 73, 39 pp., illus., processed in Spanish, Oct. 1963. (Translated from the English, *Trout and Salmon Culture*, Fish Bulletin No. 107, California Department of Fish and Game, 1959.) Departamento de Investigaciones Industriales y Economicas, Laboratorio de Tecnologia Quimica Pesquera, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

TUNA:

Background of the U. S. Regulatory Act for Yellowfin Tuna, 1962, by Ryuzo Ohyama and Koya Mimura, 60 pp., printed in Japanese. Japan Fisheries Resource Conservation Association, c/o Futaba Bldg., 24, Nishikubo, Sakuragawa-cho, Minato-ku, Tokyo, Japan.

"A pesca do atum no arquipelago de Cabo Verde" (The tuna fishery in the Cape Verde Islands), article, *Jornal do Pescador*, vol. 26, no. 309, Oct. 1964, p. 37, printed in Portuguese, single copy 5 escudos (about 20 U. S. cents). Junta Central das Casas dos Pescadores, Rua de S. Bento, 644-4^o Esq., Lisbon, Portugal.

"Pesca e industrializacion del atun" (The fishery and commercialization of tuna), article, *Industrias Pesqueras*, vol. 38, no. 897, Sept. 1, 1964, pp. 388-389, printed in Spanish, single copy 50 ptas. (about 85 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2^o, Vigo, Spain.

"Quelques aspects techniques du probleme thonier" (Some technical aspects of the tuna problem), by E. Postel, article, *La Peche Maritime*, vol. 43, no. 1040, Nov. 1964, pp. 786-791, illus., printed in French, single copy 14 F (about US\$2.85). Les Editions Maritimes, 190, Blvd. Haussmann, Paris, France.

Statistical Report on Tuna Longline Fisheries by Fishing Grounds for 1963, 33 pp., printed in Japanese, Sept. 1964. Statistical Research Division, Agriculture-Forestry Economic Bureau, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan. Describes tuna long-line production trends, catch by species, fishing grounds, and by the 6 licensed tuna fisheries (i.e. Japan-based fleet, overseas-based fleet, Atlantic fleet, mothership-type fleets, etc.). Also includes data on prefectural landings, by species

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and by vessels of different size categories. The report shows that in 1963 the Japanese tuna long-line fleet totaled 1,380 vessels (1959--1,437 vessels). They landed a total of 531,500 metric tons of tuna, spearfish, and shark. The catch of yellowfin totaled 125,100 metric tons, declining 19,100 tons, and the catch of albacore totaled 88,900 tons, down 6,900 tons. Bluefin catch increased by 11,200 metric tons, totaling 47,800 tons, and the big-eyed catch increased by 3,000 tons, totaling 128,000 tons. By ocean areas, there were increases in catches for the Pacific Ocean (9,800 tons) and Atlantic Ocean (12,600 tons); Indian Ocean catch declined 24,300 metric tons.

--Lomy M. Nakatsu

Taipei Maguro Kanzume Shosha Kyotei wo Meguru Ko-bo (Discussion of Exporters' Agreement Covering Canned Tuna Exports to U.S.), 16 pp., printed in Japanese, Oct. 1, 1964. Suisan Tsushin-sha, Chiyoda Bldg., 2-1, Kudan, Chiyoda-ku, Tokyo, Japan. A special issue put out by a Japanese newspaper firm covering problems involving the exporters' agreement on canned tuna for export to the United States. The agreement, renewed annually December 1, was under critical attack in 1964 from segments within the packing industry due to declining canned tuna exports, despite an increase in the United States consumption of canned tuna. The report describes the reasons for the packers' dissatisfaction and the defense made in behalf of the agreement. As of December 4, 1964, settlement over a new agreement covering the period December 1, 1964-November 30, 1965, had not been reached.

--Lomy M. Nakatsu

"Tuna--international fish," by Jean V. Leyendekkers, article, Fisheries Newsletter, vol. 23, no. 11, Nov. 1964, pp. 23-25, illus., printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia. Tuna has been caught and eaten by man since earliest times. Its place in the fishing world of today is no less dominant, since it is one of the major fisheries in Japan, the United States, Chile, France, and a number of other nations. This article, the first in a series of two, discusses the habits and habitats of tuna, occurrence of various species in Australian waters, research by Australian scientists, tagging information and its uses, and distribution and migration paths.

Tuna Long Line Operations in the West Coast of India, by P. K. Eapen, 7 pp., illus., printed. (Reprinted from Indian Sea Foods, vol. 2, no. 1.) Government of India, Offshore Fishing Station, Cochin-5, India. Discusses tuna fishing methods, commencement of tuna long-line fishing in India, exploratory vessel and gear used for long-lining, details of operation, catch rate, and uses and commercial possibilities. Includes statistical tables showing data on 5 exploratory cruises for tuna; and length and weight of fish landed.

TURKEY:

Balik ve Balikçilik (Fish and Fishery), vol. 12, no. 11, Nov. 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikçilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, articles on "Arrangement of otter boards to deep trawl," by Tekin Mengi; and "Observations of Ancona International Fishery Fair and Italy fisheries by technical point of views (Part IV)," by Muzaffer Ozay.

TURTLES:

Clasificacion de las Tortugas de Norteamerica (Capitulo XXXVI) y las Tortugas Marinas (Capitulo XXXVII), (Classification of the Turtles of North America--Chapter XXXVI--and the Marine Turtles--Chapter XXXVII), by Raymond L. Ditmars, Serie: Trabajos de Divulgacion, vol. IX, no. 81, 17 pp., processed in Spanish, Jan. 1964. (Translated from the English, The Reptiles of North America.) Departamento de Estudios Biologicos Pesqueros, Direccion General de Pesca e Industrias Conexas, Secretaria de Industria y Comercio, Mexico, D. F.

UNDERWATER ACOUSTICS:

"Underwater sound: deep-ocean propagation," by Robert A. Frosch, article, Science, vol. 146, no. 3646, Nov. 13, 1964, pp. 889-894, illus., printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005. Variations of temperature and pressure have great influence on the propagation of sound in the ocean.

U. S. S. R.:

"Developments of large-scale chemistry and technical progress in the fishing industry," by V. P. Zaytsev, article, Recent Developments in the Fishing Industry, USSR, JPRS 25,670, pp. 1-11, processed, July 31, 1964, \$2. (Translated from the Russian, Rybnoe Khozyaistvo, no. 5, 1964, pp. 3-7.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

WASHINGTON:

Washington State Department of Fisheries, 1963 Annual Report, edited by Don Reed, 216 pp., illus., printed. Washington State Department of Fisheries, Rm. 115, General Administration Bldg., Olympia, Wash. Includes information on the activities of the Department of Fisheries during 1963 in research and management--Puget Sound commercial fisheries, troll salmon, coastal investigations, ocean sport fishery, Columbia River fisheries, otter-trawl fisheries, and chum sampling; and power dam research--Cowlitz River project, Lake Merwin program, Priest Rapids spawning channel, Rock Reach spawning channel, Baker River studies, and 1963 fish facilities for power dam projects. Sections are also included on pink salmon research, Indian fisheries, 1963 sport salmon fishery, reimbursable services program, stream improvement, Patrol Division--enforcement, and engineering and construction. Specialized problems are dealt with in chapters on razor clam fisheries in 1963, oyster work, Willapa Bay shellfish management, hatchery runs, salmon marking programs, fish disease investigations, silver salmon studies, fish feeding 1963, egg takes at individual hatcheries, adult escapement to hatchery rocks, fish planted from State salmon hatcheries in 1963, total plants by district and species 1950-63, and fish planted by major watersheds 1963. A considerable portion of the report is devoted to 1963 fisheries statistics on commercial landings and fishway counts.

WATERFRONT BOUNDARIES:

Shore and Sea Boundaries. Volume Two--Interpretation and Use of Coast and Geodetic Survey Data, by Aaron L. Shalowitz, Publication 10-1, 775 pp., illus., printed, 1964, \$5.25. Coast and Geodetic Survey, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Print-

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ing Office, Washington, D. C. 20402.) Deals with the use and interpretation of Coast and Geodetic Survey data, particularly the early surveys and charts, with special emphasis on those features and aspects having legal significance. It interprets for the engineer and the lawyer the topographic and hydrographic surveys and nautical charts of this 157-year-old Government agency in their relation to the establishment of riparian boundaries. It reflects participation by the nation's oldest scientific bureau--through its records and through the expert testimony of its officials--in many important waterfront litigations, some of which involved a boundary demarcation on the ground. Contains 12 chapters which cover the history and organization of the Coast and Geodetic Survey since 1807, when it was established by Thomas Jefferson; technical data pertinent to waterfront boundaries; geographic datums; judicial structure and land ownership in the United States; and the application of Coast Survey data to engineering and legal problems. Numerous citations are furnished to legal and technical authorities. Also contains 7 appendixes, including a comprehensive glossary of terms used in the text; a bibliography of technical

and legal sources cited; selected statutes pertaining to the Coast Survey; cases which have had an important impact on the development of the law of tidal boundaries in the United States; and a multicolor reproduction of nautical chart symbols and abbreviations.

WHALE OIL:

"Analysis of fatty acids and fatty alcohols composition of sperm whale oil by gas-liquid chromatography," by M. Mori and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 30, 1964, p. 161, printed in Japanese. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

WHALES:

"O svyazyakh v raspredelenii zooplanktona morskikh ptits i usatykh kitov" (On interrelations in the distribution of zooplankton, marine birds and baleen whales), by V. M. Gudkov, article, Trudy Instituta Okeanologii Akademii Nauk SSSR, vol. 58, 1962, pp. 298-313, printed in Russian. Izdatel'stvo Akademii Nauk SSSR, Moscow, U.S.S.R.



USES OF PORPOISE-JAW OIL

Porpoise-jaw oil is one of the many materials that keep the wheels of American industry turning. Marine mammals of the cetacean group (including certain whales and most dolphins and porpoises) have small quantities of oil in cavities of the head, especially in the brain "melon" and in the glands of the "hinges" of the jaws. This porpoise-jaw or dolphin-head oil is unique in its chemical composition (different from blubber oil), and its physical characteristics make it an excellent lubricant for watches, micrometers, and other fine instruments.

While the market for these special oils is understandably small (one gallon is said to be sufficient to lubricate at least a million watches), it is nevertheless an important one. Synthetic oils have taken over in some applications, but most of the major industrial companies in the United States use at least small quantities of the dolphin oil for special needs, usually in combination with oils from other sources. The resulting lubricants have a low-pour point--that is, they maintain their liquid state at temperatures as low as 30° below zero F. and they are resistant to oxidation, gumming, and evaporation. Also, because of their unique fatty acid content, porpoise-jaw oils are relatively more "oily" than other oils. The combination of properties leads to their use on delicate mechanisms that must function smoothly after standing idle for prolonged periods.

The business of supplying porpoise-jaw oil was established in the whaling port of New Bedford, Massachusetts, in the middle of the last century, but only the refining process is carried on there today, by one sole remaining refiner. The present raw material source is the blackfish, or pothead whale, one of the largest of the dolphins, which is harvested in Newfoundland. The meat is sold for mink feed, the blubber is rendered for soap, margarine, and other shortening, and the head oil is shipped to New Bedford for refining and formulating. (Industrial Bulletin of Arthur D. Little, Inc., September 1964.)

JAPANESE CULTURED PEARLS

Pearls were originally obtained only in their natural state in pearl oysters living in the sea. The pearl is formed from nacre secreted gradually by the oyster. The pearl is formed when foreign matter accidentally gets into the oyster and the oyster, in order to protect itself from the intruder, secretes nacre around it and seals it off.

There are many types of mollusks which emit such nacre, but not all of the pearls formed are valued for use in jewelry. The pearl-like substance found in the common clam and the shortnecked clam is only a white lump and has no value whatsoever. The only pearl shells which produce genuine pearls are the pearl oyster, the white and black-lip oyster, and a few others.

Natural pearls were found in the past in oysters in the bays of Persia, near the island of Ceylon, and off the Australia coast. However, the quantity was limited and only kings and noblemen were able to acquire those rare jewels.

Pearl cultivation was started relatively long ago. It has been recorded that a Swede succeeded in cultivating hemispherical pearls in 1760. According to the method used then, a hole was drilled in the shell of the oyster and a bit of foreign matter was inserted into the flesh of the oyster. Other methods developed were similar to the Swedish method. All utilized the instinctive power of the oyster to cover the foreign matter with nacre.

The first person in Japan to succeed in cultivating pearls was the late Kokichi Mikimoto, who later gained fame as the "Pearl King." His first products were hemispherical pearls which were attached to the shell. Five years later, in July 1893, Mikimoto discovered several semispherical pearls in the type of pearl oyster called Akoyagai. Since then cultured pearls produced in Japan have been exported to overseas markets, and in 1904, on the occasion of the St. Louis World's Fair, Japan exhibited its cultured pearls abroad for the first time.

Mikimoto's success in cultivating pearls provided the basis for a flourishing business and production of a large quantity of cultured pearls began. However, the products were all semiround pearls and were not suitable for adornment. Therefore, it was necessary to round out the flat part of the pearl by joining it with a piece of pearl shell or another semispherical pearl. Studies to rectify this defect were carried out by Mikimoto and other pearl cultivators and finally, about 1908, they succeeded in developing perfectly round pearls.

With successful cultivation of round pearls, the industry has flourished in Japan to this day. Some 24 prefectures, centering around the Nankai district, are now cultivating pearls. The mother oyster used in Japanese pearl farms is the Akoyagai. The ideal place for the cultivation of this mollusk is a quiet sea where the water is not too salty and the temperature of the water is from 15° to 25° C. (59°-77° F.). In other words, the most ideal places are the small inlets and bays of islands in the southern part of Japan.

Pearl cultivation begins with the raising of the Akoyagai oyster. During June and July, rafts are floated on the sea and clusters of the foliage of the Japanese cedar are tied with ropes and hung under the rafts. These two months are the egg-laying period for the Akoyagai, and a large number of eggs become attached to the leaves. The eggs are then collected and placed in woven wire baskets and hung under the raft for another two to three years. When the shell grows to 30 to 40 grams in weight, it can be used as a mother oyster. This operation is handled by the oyster cultivators.

The pearl cultivators now take over and insert pieces of foreign matter into the oysters. Since the foreign matter will become the core of the pearl, care must be taken in the selection of the material to be used. The material generally used for the core are pieces of shell

(Continued on next page.)

from ditch clams. The shell is cut into small pieces of several millimeters in thickness and are inserted into the body of the mother oyster with a pincet. The mother oyster then starts to secrete the lustrous nacre.

When the piece of shell is inserted, part of the membrane of the mantle of the living oyster is cut out and inserted together with the nucleus. This step is supposed to accelerate the rate of secretion of nacre by the oyster. After the nucleus has been implanted in the oyster, the oyster is again placed in a basket and hung under the raft. The oyster secretes nacre which gradually surrounds the nucleus and in a year, small cultured pearls are available. It takes from 2 to 3 years to produce medium pearls and from 5 to 6 years for large pearls.

However, not all of the oysters will survive. Because of the "red current" and other damaging parasites which afflict the oyster, only about 4,000 out of 10,000 oysters will manage to survive and produce pearls. Of the pearls produced by the 4,000 oysters, only about 10 to 15 percent are commercially marketable.

The size of pearls produced in Japan is generally from 1 to 3 millimeters in diameter with a maximum of 10 millimeters. It is considered difficult to cultivate pearls of more than 12 millimeters as the size of the mother oyster is limited.

There are numerous colors ranging from white and silver to pink, cream, black, and blue. Pink and white pearls are popular in Japan and Western countries. Pearls of different colors are produced not only because of the individual differences of the nacre excreted by the oysters but also due to the type of sea water the oyster had been placed in. Studies on producing any color desired have been conducted but objections have been raised, claiming that to do so commercially would devalue the pearl's value as jewelry.

Japan produces about US\$56 million worth of cultured pearls a year. Some 90 percent are exported. Last year, exports amounted to \$47.2 million--a two-fold increase over the \$23.6 million exported in 1959. Some 40 percent of the exports are consigned to the United States, another 20 percent to Switzerland, and the bulk of the remainder to West Germany, Hong Kong, France, Italy, and India.

Prior to export, a Government inspector examines each pearl to prevent any inferior product from being shipped overseas to maintain the prestige of Japanese cultured pearls in the world market. (Japan Information Service, Consulate General of Japan, New York City.)



WOMEN TAKE PART IN FISHERY RESEARCH CRUISES

A new precedent has been set at the U. S. Bureau of Commercial Fisheries Biological Laboratory, Woods Hole, Mass. Women now routinely take part in the Bureau's biological-oceanographic cruises. Mrs. Ruth Stoddard, Fishery Research Technician, and Miss Lisbeth Francis, Antioch trainee, broke the ice on the fall 1964 survey cruise. This particular cruise lasted 15 days and was noteworthy for the consistent bad weather encountered. But the young ladies suffered not one day of seasickness. It was the considered opinion of the scientific and vessel crew that the ladies were as good or even better than their male counterparts in getting the work done.

BIOLOGICAL CONTROL SOUGHT FOR BOAT DESTROYER

A United Nations agency and the Indian Government are joining forces with a marine flatworm to hunt the teredo, a sea worm which devours the keels of fishing vessels.

The teredo, a molluscan borer, is found in all parts of the world, although it is most active in tropical waters. It is a thin marine worm which eats its way through wood, extending its body to as much as six feet in length, and destroying piers, rafts, fishing traps, and wooden boats.

Recently, the Indian Government became alarmed at the damage which was being suffered by its fishing industry because of this undersea menace. A United States woman zoologist has been sent to India as a forestry officer for the Food and Agriculture Organization in order to begin basic research into the life history of these small creatures and to explore methods of controlling their destructive activities.

" All timber exposed to sea water is also exposed to the ravages of the teredo. It attaches itself to the outside of the timber and, with the aid of its grinding teeth, bores right through into the interior, eating the sawdust as it goes. A borer can grow up to six feet in length. The end of the body, which is equipped with a muscle to close the hole behind it when necessary, usually sticks out into the water. A series of tiny feelers are used to eject the body wastes and pass in water and minute particles of food.

These borers have been known to man since he first began sailing the seas, and have in fact, gradually encircled the earth as a consort of man. Burrowed deep within the wooden keel of the windjammers, the teredo has been given free passage through all the oceans.

A boat in infested waters can be completely destroyed in as little as three months. The traditional method of clearing infested timber is to bring the boats into fresh water, though experience has shown that the teredo can retire into the woodwork, seal itself in, and remain dormant for long periods of time.

Nowadays timber is impregnated with chemicals, usually creosote. Even so, an adult borer will on occasion go through a creosote-impregnated plank.

The zoologist is investigating a completely new and untried biological method of controlling the borer while she is in India. She has found that certain species of marine flatworms eat the eggs of the teredo. She believes that flatworms distributed in badly-infested areas might attack and wipe out the borer population.

Disappearance of the teredo would not be universally welcomed for the borer is regarded as a food delicacy in some parts of the world. It is eaten as a normal part of the diet by many fishing populations of South East Asia, as well as the Australian aborigines. Malayan fishermen go so far as to harvest the borer. They set out softwood stakes in the sea-bed and wait for them to become infested with these creatures. Then the stakes are pulled up and taken to land and the borers pulled out and eaten.

The zoologist is working with the India Forest Research Institute at Dehra Dun, where she is training research staff in the identification and laboratory breeding of marine wood-boring molluscs, and in the development of control methods against the molluscs. (Food and Agriculture Organization, Rome, Italy, December 16, 1964.)

THREE SPRING-STYLE RECIPES

There may be times when three is a crowd, but it's a "crowd-pleaser" when the trio happens to be made up of three unusual new seafood dishes designed to fit any menu with taste-pleasing style.

Home Economists of the U. S. Department of the Interior's Bureau of Commercial Fisheries have painted a "picture of wealth" for the homemaker with the creation of three colorful dishes that bring together the elegant, the exotic, and the easy for the ultimate in good eating.

The Elegant--Shrimp in Sour Cream brings all the charm of the old South to your table with today's convenience.

The Exotic--Red Snapper with Curry Sauce brings the enchantment of the Middle East to dinner in a colorful, eye-appealing entree that will intrigue, entice, and haul in a netful of compliments from your mealtime guests.

The Easy--Fish Portions with Almond Cheese Sauce has a natural appeal to any homemaker because it's a fast-to-fix treat with an up-to date beat.

SHRIMP IN SOUR CREAM

1 pound cooked, peeled, and cleaned shrimp, fresh or frozen or	1 tablespoon flour
4 cans ($4\frac{1}{2}$ or 5 ounces each) shrimp	1 can (10 ounces) frozen condensed cream of shrimp soup, thawed
1 can (4 ounces) sliced mushrooms, drained	1 cup sour cream
2 tablespoons chopped green onion	Dash pepper
2 tablespoons butter or margarine, melted	Toast points or patty shells

Thaw frozen shrimp or drain canned shrimp. Rinse canned shrimp with cold water. Cut large shrimp in half. Cook mushrooms and onion in butter until tender. Blend in flour. Add soup and cook until thickened, stirring constantly. Add sour cream, pepper, and shrimp. Heat, stirring occasionally. Serve on toast points or in patty shells. Serves 6.

RED SNAPPER WITH CURRY SAUCE

Red Snapper

2 pounds red snapper fillets or
other fish fillets, fresh or frozen
 $\frac{1}{2}$ cup flour
1 teaspoon curry powder

1 teaspoon salt
Dash pepper
Curry Sauce

Curry Sauce

$\frac{1}{2}$ cup chopped onion
2 tablespoons melted fat or oil
1 teaspoon curry powder
 $\frac{1}{4}$ teaspoon salt
1 cup sour cream
1 tablespoon chopped parsley
1 teaspoon dry white wine

Thaw frozen fillets. Skin fillets and cut into serving-size portions. Combine flour, curry powder, salt, and pepper. Roll fish in flour. Fry in hot fat at moderate heat until brown on one side. Turn carefully and brown the other side. Total cooking time approximately 8 to 10 minutes, depending on thickness of fish. Arrange fish on a warm serving platter. Pour Curry Sauce over fish. Serves 6.

Cook onion in fat until tender. Blend in curry powder and salt. Add sour cream and heat, stirring constantly. Add parsley and wine. Makes approximately 1 cup sauce.

FISH PORTIONS WITH ALMOND CHEESE SAUCE

6 frozen raw breaded fish portions
($2\frac{1}{2}$ or 3 ounces each)
2 tablespoons melted fat or oil

Paprika
Almond Cheese Sauce

Place frozen fish portions on a well-greased cookie sheet, $15\frac{1}{2}$ x 12 inches. Drizzle fat over fish. Sprinkle with paprika. Bake in an extremely hot oven, 500° F., for 15 to 20 minutes, or until brown and fish flakes easily when tested with a fork. Serve with Almond Cheese Sauce. Serves 6.

Almond Cheese Sauce

2 tablespoons chopped celery
2 tablespoons chopped onion
2 tablespoons melted fat or oil
1 can ($10\frac{3}{4}$ or 11 ounces) condensed cheese soup
 $\frac{1}{3}$ cup blanched slivered almonds

2 tablespoons catsup
2 tablespoons chopped parsley
2 teaspoons lemon juice
 $\frac{1}{4}$ teaspoon curry powder
Dash liquid hot pepper sauce

Cook celery and onion in fat until tender. Add remaining ingredients and simmer for 10 to 15 minutes, stirring occasionally. Makes approximately $1\frac{2}{3}$ cups sauce.

*A Tongue in "Chic" Look at the Slightly
"So-fish-ticated" Spring Seafood Styles*

A SPRING SHOWING OF

Seafood Styles

--From Food Editor Press Kit, U. S. Bureau
of Commercial Fisheries, Washington, D.C.

EXCLUSIVELY

FOR

YOU

Shrimp in Sour Cream

Fish Portions with
Almond Cheese Sauce

Red Snapper
with Curry Sauce

(See page 132 for recipes.)



44463X Fishes

ROBERT H. GIBBS JR.

COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 4

APRIL 1965

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

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5/31/68

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EXPLORATORY FISHING FOR SPINY LOBSTERS, SAND LOBSTERS, AND SCALLOPS IN PANAMA

By Norman L. Pease*

SUMMARY

An interagency agreement between the U. S. Bureau of Commercial Fisheries and the Agency for International Development provided for a survey of the spiny lobster potential on both coasts of the Republic of Panama. This was conducted for an 18-month period with the chartered vessel Pelican, and staffed from the Bureau's Exploratory Fishing and Gear Research Base at Pascagoula, Miss.

Lobster traps were selected for use during the exploratory phase owing to their versatility, which enabled several scattered areas to be worked simultaneously. Three types of traps were used: wire, wood, and reed. Wood traps were the most successful, and were better able to withstand the rough handling experienced during fishing operations. Up to 200 traps a day could be hauled and reset during exploratory work. A variety of locally caught bait was used without any strong preference being indicated by the catch results. Decomposed bait and puffers did not prove effective.

Exploratory fishing revealed three areas with good commercial lobster fishing potential: 1 Caribbean area, Bocas del Toro; and 2 Pacific areas, Gulf of Panama and Gulf of Chiriqui coast. Commercial amounts of two species of spring lobsters and one species of sand lobster were caught in those areas. The sand lobster could be caught only by trawling.

The male Pacific spiny lobster was found to be predominant in the trap catch while the female lobster was predominant in the trawl catch. Data from the catch of the female Pacific spiny lobster revealed that gravid females were more abundant in the trawl catch than the nongravid, whereas in the traps, the ratio of gravid females was slightly less than the non-gravid. The trawling was done offshore and probably influenced the catch ratio because the spawning females seek areas with favorable offshore flowing currents to disperse the larvae.

A bay scallop with commercial potential was found in the Gulf of Panama. Within 2 months, over 400 people afloat and ashore were employed catching and processing scallops.

*Fishery Biologist (General), Exploratory Fishing and Gear Research Base, U.S. Bureau of Commercial Fisheries, Pascagoula, Miss.



Fig. 1 - R/V Pelican approaching a flag buoy which marks a lobster trap location.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 730

INTRODUCTION

In 1961, local fishermen were exploring with modern techniques and equipment only two of the natural marine resources of the Republic of Panama. These were shrimp and sardine-like fish. Most food fish consumed within Panama was still being taken with hand lines; a small number were taken incidental to the shrimp fishery; and there was some beach seining. For many years an important pearl oyster and pearl-oyster shell fishery flourished along the Pacific coast. That fishery started declining after 1925 (Galtsoff 1948); it has now been defunct for more than 25 years. Approximately 25 percent of the 886 miles of the Pacific coastline of Panama was being used in established fisheries. The 489 miles of its Caribbean coastline were almost completely undeveloped. Only a small amount of food fish was caught (for personal consumption) along that sparsely settled coast. Several years ago a fishing cooperative was established at a small coastal community in the Gulf of Panama. That cooperative is attempting to introduce new fishing methods and fish-handling techniques.

It was with this background that the U. S. Agency for International Development (AID) requested the U. S. Bureau of Commercial Fisheries to study the feasibility of developing new fisheries in Panama. The resultant report indicated possibilities that two resources, sharks and spiny lobsters, might be developed.^{1/} One recommendation in the report was that an exploratory fishing survey be made to determine the spiny lobster resources of the Caribbean and Pacific coasts of Panama. That suggestion was approved, and the Bureau and AID negotiated an interagency agreement for the survey. The initial agreement was extended so that the entire survey was conducted for an 18-month period from July 1962 to December 1963. The responsibility for the survey was assigned to the U. S. Bureau of Commercial Fisheries Exploratory Fishing and Gear Research staff located in Pascagoula, Miss.

VESSEL AND EQUIPMENT

A 72-foot, steel-hulled shrimp trawler, Pelican, was chartered by the Bureau for use during the survey (fig. 1). Some modifications were made to the vessel, and some additional equipment was installed--a flying bridge equipped with steering and engine controls, new davits on the stern for carrying a skiff, and air conditioning units for the living quarters. A hydraulically-operated boom and power block were installed amidships at the port rail for use as a trap hauler. Additional electronic equipment was installed as follows: radar, loran, single-side band and citizen-band radio transmitter-receivers, radio direction finder, and two depth-recorders. The fuel and fresh-water capacity was for a range of 2,500 miles. Accommodations were provided for 5 staff members or cooperators and a permanent vessel crew of 5.

A 17-foot outboard-powered skiff was carried for working traps in shallow-water areas (fig. 2). Equipped with a depth-sounder, which recorded in feet, the skiff was capable of carrying 3 men and between 15-25 traps in areas not navigable by the Pelican.

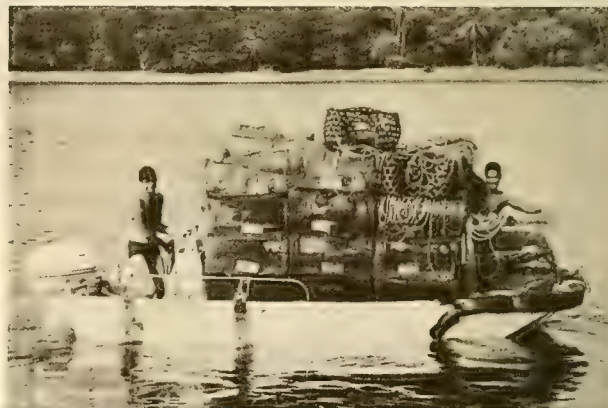


Fig. 2 - The 17-foot fiberglass skiff loaded with wire and reed lobster traps.

FISHING GEAR

Lobster traps were selected as the primary fishing gear for the survey. This was because of their demonstrated proficiency in successful lobster operations throughout the world and because of their adaptability to either a large- or small-scale fishing operation. The traps used were constructed of three different materials--reed, wire, and wood.

^{1/}A program for the More Effective Use of Panama's Fishery Resources, PIO/T 525-29-060-10037, Washington, D. C., June 30, 1961 (mimeographed report from the Bureau of Commercial Fisheries to the U. S. Agency for International Development).

REED TRAPS: The woven reed traps used were acquired in Nicaragua. They were similar in design to those used in other tropical areas (fig. 3). Efforts to replenish the supply of that type trap became difficult, owing to a limited amount of reed in Nicaragua and the lack of shipping facilities. The traps were 14 inches high and 32 by 36 inches wide with a single funnel opening on one side. A 15-pound cement block was wired to the bottom of the trap to keep the trap upright on the ocean floor.



Fig. 3 - A reed trap being hauled aboard the Pelican. The side funnel shows at left.



Fig. 4 - A wire lobster trap being hauled aboard the Pelican. The hydraulic block and its connections are visible.

WIRE TRAPS: Wire traps were made locally from either $\frac{3}{4}$ - or 1-inch hardware cloth and measured 36 x 36 x 14 inches (fig. 4). Various funnel arrangements were tried; both side and top funnels were used as were multiple funnels. Each trap had a cement block wired to its bottom.

WOOD-SLAT TRAPS: Wood traps were constructed of 1- by 2-inch slats and measured 2 by 3 feet at the base (fig. 5). The sides sloped-in approximately 2 inches from bottom to top. Each trap was 18 inches deep and had an 8-inch square funnel on the top that extended 6 inches into the trap. For weight, 1 inch of cement was poured into partitions on each end of the trap.

FLAG BUOYS AND LINES: Flag buoys were used to mark the location of one trap or a multiple set of traps (fig. 6). They were made using a 40-inch wood pole which had 3 square inches of cement at the base. Two to three 6-inch squares of 2-inch styrofoam were secured slightly below the middle of the pole, and a flag was attached to the top. The use of fluorescent orange paint on either the pole or the flag assisted in locating it. A 2-fathom length of line, with an additional styrofoam float at its end, was secured to the buoy; this provided a target area for the retrieving grapnel. A $\frac{5}{16}$ -inch manila or sisal buoy line was secured from the 2-fathom float line to the trap. The lengths of the buoy lines were adjusted according to the depth of the water; however, 15-fathom lengths were most frequently used.

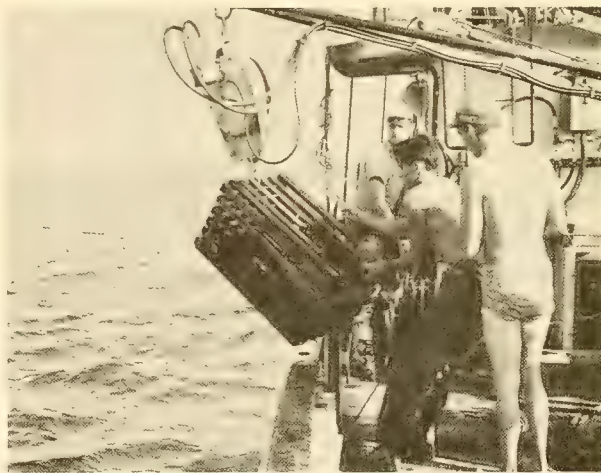


Fig. 5 - A wood-slat lobster trap being hauled aboard the Pelican, with the top funnel showing.



Fig. 6 - A basket of Pacific spiny lobsters, *Panulirus gracilis*. Flag buoys and wood-slat lobster traps are in the background.

ography, currents, and other environmental conditions determined after on-the-scene observations. Another factor considered was the proximity to coastal towns and fishing communities.

When the fishing location had been determined, buoy lines were tied to the traps, which had been baited and stacked in units of two on deck. The vessel then traveled a predetermined course at a reduced speed, and the traps were set. A flag was first thrown into the water. When all the buoy line had been payed out, the trap was dropped. This was followed immediately by the next buoy, and the process was repeated until all the traps had been set. Sometimes, multiple sets were made. Main buoy lines from 2 or 3 traps were connected in sequence, and a flag buoy was used only on the first trap. This technique reduced hauling time, but occasionally many traps were lost when buoy lines parted.

Traps were retrieved by using a grapnel to hook the 2-fathom float line and pulling in enough buoy line slack to reach the block of the hydraulic trap hauler. The trap was then hauled aboard over the hauler, the lobsters were removed, and traps were rebaited and stacked for resetting (fig. 7). About 50 traps at a location were handled in that manner. The greater the distance between fishing locations, the fewer the traps per day that could be handled. Owing to the exploratory nature of the survey, fishing locations were generally widely spaced, thus allowing a maximum of approximately 200 traps per day to be hauled and reset.

Bait was taken by trawling with a standard 40-foot semiballoon trawl (Bullis 1951), by trolling, by long-lining for sharks with 10-hook units of Japanese long-line gear (Captiva 1955), and by hand-lining during the day or by night with lights for attraction. Experiments were made to determine whether or not lobsters showed any significant preference for any of a variety of locally-caught bait. Among the species of fish used were black skipjack, several species of sharks, jacks, anchovetas, and species of bottomfish such as snapper, croaker, majarra, goatfish, threadfin, and others. Large fish were cut into 6-inch strips, and small fish were used whole. Several fish, or pieces of fish, were strung on soft baling wire and secured to the bottom of the trap where it would be impossible for a lobster to reach them from the outside. All the species used were

LOBSTER TRAWL: A 40-foot, 4-seam shrimp trawl made from 2-inch synthetic webbing, which had been used for catching bait, was slightly modified for lobster fishing. Twenty-two 9-inch rollers were strung on a $\frac{1}{4}$ -inch nylon line, which was seized to the foot-rope between each roller. A $\frac{1}{4}$ -inch tickler chain, connected to the lower rear bracket of each door, was adjusted to scrape the bottom just ahead of the trawl.

FISHING METHODS

Several factors determined which areas were to be explored. Initially, the coastal and island areas were separated into geographic zones that could be conveniently covered during a single cruise. Locations within those zones were further delineated by bottom top-



Fig. 7 - Removing a spiny lobster from a reed lobster trap.

found to work with equal efficiency as long as they were fresh. Putrefied bait appeared to be less attractive. Fish with spines or other sharp protuberances were not used for personal safety reasons.

Only one species of fish, a puffer (*Spaeroides annulatus*) was found to be unsuccessful as lobster bait. When that fish was used as bait, it would not attract lobsters; when it was mixed with other species, it would be ignored, but the other fish would readily be consumed. Halstead and Russell (1956) report two toxic substances isolated from a puffer found in Japanese waters, which when ingested by humans can cause illness within 30 minutes and coma and possible death within 1-24 hours.

FISHING RESULTS

LOBSTER AREAS: During exploratory fishing, three areas of potential lobster production were located, 1 on the Caribbean coast and 2 on the Pacific. Each area, in addition to having extensive reef or rocky bottom conditions, which could sustain large lobster populations, was also close to population centers with established transportation systems. The Bocas del Toro area was explored on the Caribbean coast; Chiriqui Gulf and the northwestern section of the Gulf of Panama (fig. 8) were explored on the Pacific coast. Although lobsters were found in other explored areas, a reduced amount of favorable bottom or the remoteness of the other areas from any community forestalled further immediate interest.

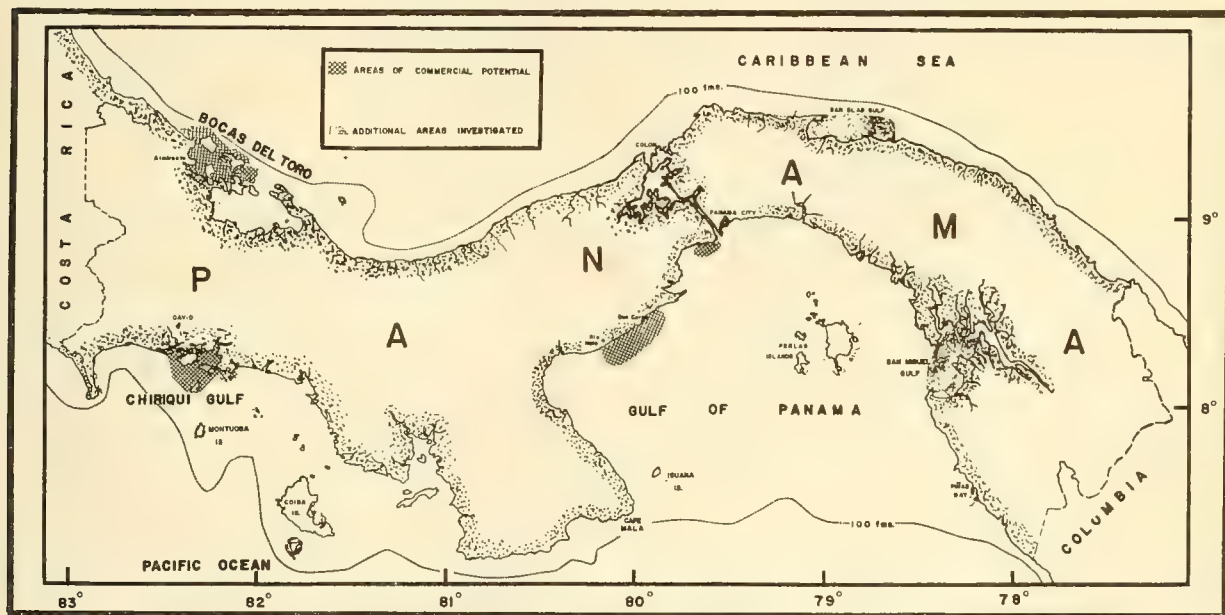


Fig. 8 - Chart of Panamanian waters with areas of commercial lobstering potential and all other areas investigated indicated.

EFFECTIVENESS OF TRAPS: A comparison of the catch per unit of effort indicated that in the order of effectiveness of the three types of traps used, wood was most successful, followed by reed, then wire. The wood traps had a 48-percent catch per unit of effort, the reed 27 percent, and the wire 25 percent. The reed traps, and the wire to a slightly less degree, were also found to be susceptible to shark damage.

Experiments to determine the optimum number of days between hauling traps indicated that maximum catches were made from those traps which were fished for 2 to 3 days. It was found that after 3 days, the bait had generally been consumed or else it had become badly decomposed and was less effective. From 4 days on, after the bait had been entirely consumed, it was not uncommon to find that 1 or 2 of the lobsters had been devoured by the rest of the lobsters still in the trap.

LOBSTER SPECIES: Three species of lobsters were found in commercial quantities during the survey. In the Bocas del Toro area, the Caribbean spiny lobster, Panulirus argus, was caught by traps in depths up to 10 fathoms. On the Pacific side, in the Chiriqui Gulf, a Pacific spiny lobster, P. gracilis, was caught by traps within the same depth range. In the Gulf of Panama, P. gracilis was caught by both traps and by trawls, and a Pacific sand lobster, Evibacus princeps, was caught with trawls (fig. 9). Trapping of lobsters was generally carried out between 50 yards and 1 mile from land or exposed rock formations, whereas the trawling was conducted between 2 and 5 miles from shore.

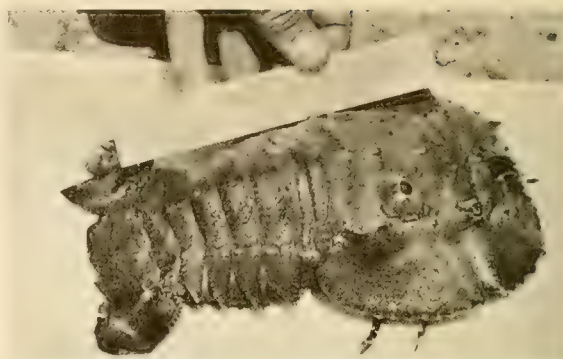


Fig. 9 - A Pacific sand lobster, Evibacus princeps. This specimen can be identified as a female by the divided tip of the 5th leg visible in photograph.

SIMULATED COMMERCIAL FISHING: Two simulated commercial fishing cruises were conducted in the Gulf of Panama. During the first of those cruises, wood traps were used for 22 days of fishing, and 1,066 spiny lobsters weighing 1,458 pounds were caught. A total of 200 traps had been set. Each day 100 of those were hauled, rebaited, and reset. The daily catch rate varied from 20 to 109 pounds of lobsters. A combination of new, unseasoned traps and strong winds adversely affected the catch rate for 9 of the 22 days. During the second cruise, in 45 drags with a lobster trawl, 2,847 spiny and sand lobsters were caught which weighed 2,758 pounds. The bottom in the 14-square-mile area worked was hard, with low-lying coral and rocks. Only one major tear-up of the net occurred, although the tickler chain was broken several times. Except for those drags that were shortened by tear-ups or broken chains, all drags were 90 minutes long.

Lobster catches from the drags varied from 10 to 210 pounds. Relative numbers of the two species of lobsters taken also varied among drags. However, the composition of the total catch for the cruise was approximately 60 percent Pacific sand lobsters and 40 percent spiny lobsters.

LOBSTER SPAWNING AND RELATED MIGRATION: With the exception of a portion of the trawl catches, all lobsters were separated by sex, weighed, and measured. The sexual development of the female lobster was noted. The total weight was recorded to the nearest ounce, and the dorsal length of the carapace was recorded in millimeters. The term gravid, as used here, includes both the berried or egg-bearing lobster and those with sperm sacs on their thorax. This definition was adopted because it was observed during field examinations that female lobsters with sperm sacs were in a ripe or ripening condition and would shortly be releasing eggs. Only adults were included in the nongravid category. The inshore fishing, during the survey, was primarily between 5 and 10 fathoms or from 50 yards to 1 mile from land. Because of the extensive Continental Shelf in the Gulf of Panama, the offshore fishing was also in the 5- to 10-fathom depth range, but the distance from the nearest land varied between 2 and 5 miles.

To derive useful information on spawning required collections for a full 12-month period. This was accomplished for the Pacific spiny lobster, P. gracilis. Owing to adverse weather conditions and the geographical distances involved, an insufficient amount of spawning data was collected for the Caribbean species of spiny lobster, P. argus. The Pacific sand lobster was not located in commercial quantities until just prior to the end of the project; this precluded any opportunity to collect the necessary seasonal information. An indication that additional species of lobsters might be available was revealed by the capture of one specimen of the Caribbean sand lobster, Scyllarides aequinoctialis, in 8 fathoms off the northwest coast of Panama.

A total of 877 Pacific spiny lobsters, P. gracilis, were examined from the catches of simulated commercial trap fishing in the Gulf of Panama. The sex ratio of this catch was 542

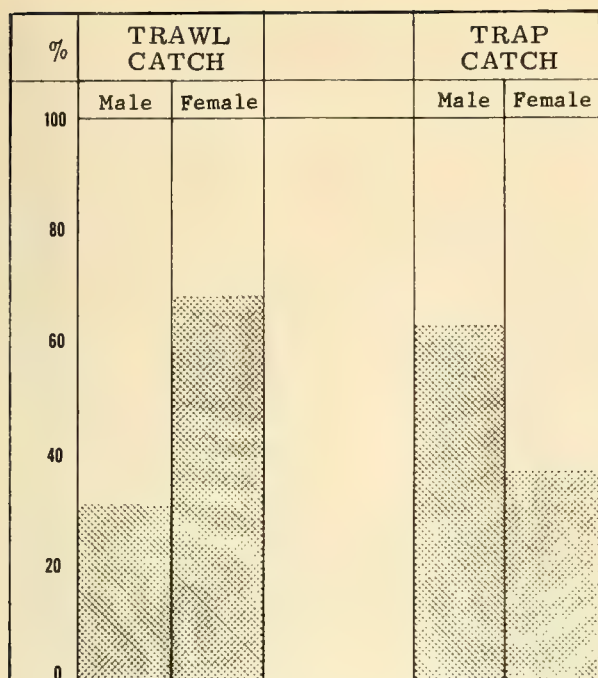


Fig. 10 - Graph showing the inverse sex ratio between the trawl and trap-caught Pacific spiny lobster, *P. gracilis*.

Traps were fished in September, and the trawling was carried out during December. Because the depth, temperature, and salinity of the waters fished were similar in both instances, this seasonal difference is not considered significant. The only apparent variable that might account for the differences in sex ratio was that the trawls were operated from 2 to 5 miles offshore whereas trapping was done from 50 yards to 1 mile from either land or exposed rock formation. A total of 861 female lobsters that had been caught in inshore waters were examined (fig. 11). Of those, 405 or 47 percent were gravid and 456 or 53 percent were nongravid. Also, 204 female lobsters caught by trawls in offshore waters were examined. Six of those were juveniles and were not used in the data. Of the remaining 198, 183 or 92 percent were gravid and 15 or 8 percent were nongravid. The gravid females, which were found offshore, were probably attracted there by the favorable offshore-flowing currents which provide maximum dispersal of their larvae. Fleming (1938) states that there is a counter-clockwise circular movement of water within the Gulf of Panama which has a velocity of approximately 0.5 knot. The spiny lobster larvae are reported by Thorson (1961) to have a pelagic life of 150 to 180 days.

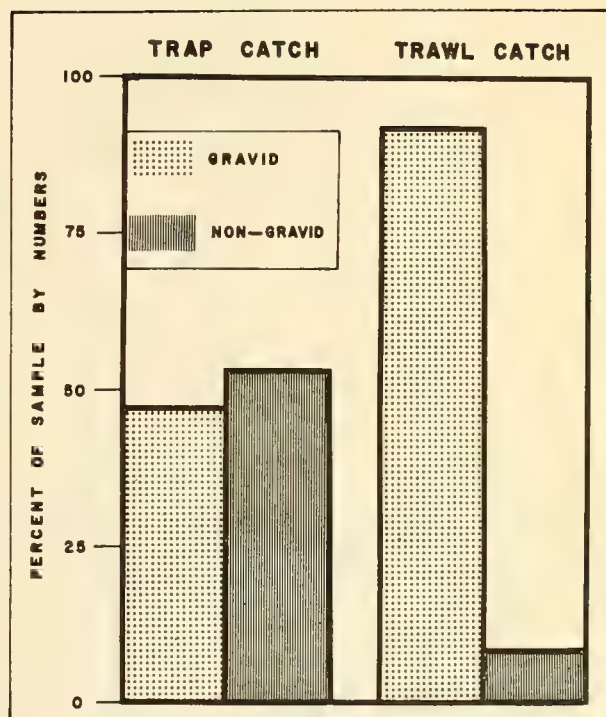


Fig. 11 - Ratio of gravid and non-gravid female Pacific spiny lobsters, *P. gracilis*, caught by traps and trawls.

Traps were fished in September, and the trawling was carried out during December. Because the depth, temperature, and salinity of the waters fished were similar in both instances, this seasonal difference is not considered significant. The only apparent variable that might account for the differences in sex ratio was that the trawls were operated from 2 to 5 miles offshore whereas trapping was done from 50 yards to 1 mile from either land or exposed rock formation. A total of 861 female lobsters that had been caught in inshore waters were examined (fig. 11). Of those, 405 or 47 percent were gravid and 456 or 53 percent were nongravid. Also, 204 female lobsters caught by trawls in offshore waters were examined. Six of those were juveniles and were not used in the data. Of the remaining 198, 183 or 92 percent were gravid and 15 or 8 percent were nongravid. The gravid females, which were found offshore, were probably attracted there by the favorable offshore-flowing currents which provide maximum dispersal of their larvae. Fleming (1938) states that there is a counter-clockwise circular movement of water within the Gulf of Panama which has a velocity of approximately 0.5 knot. The spiny lobster larvae are reported by Thorson (1961) to have a pelagic life of 150 to 180 days.

PANAMA BAY SCALLOPS, A NEW MARINE RESOURCE: During routine bait trawling in the Gulf of Panama, 4 bushels of scallops, *Aequipecten circularis*, were captured. Their meat yield and quality were checked and found to be excellent. This information was passed on to the local shrimp trawling fleet, which dispatched four vessels to the area. Using only bottom trawls, they soon caught 23,000 pounds (whole scallops). One of the local shrimp plants made some rapid renovations that made a 24-hour continuous operation possible. More than 300 people were employed to process, pack, and freeze scallop meats. Within a short time, there were 15 trawlers, with crews averaging 6 men, working the beds. A change of gear from trawls to 6-foot reinforced expanded metal dredges enabled the vessels to double their production rate (fig. 12). During the first 2 months of operation, 658,161 pounds^{2/} of shell stock (whole scallops) were produced.

^{2/}Personal communication from Juan L. Obarrio, Director, Department of Fishes, Panama.



Fig. 12 - A Panamanian dragger double-rigged with a locally constructed scallop dredge. A deck load of Panama Bay scallops, Aequipecten circularis, can be seen.

Three private lobster trapping operations were in various stages of development at the end of the project. Two had boats in the 30- to 40-foot length range being modified and the third, using small craft to handle his traps, had constructed a lobster-holding pound.

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ON-THE-JOB TRAINING PROGRAM FOR TRAINEE COMMERCIAL FISHERMEN

By John J. Murray*

ABSTRACT

Under the provisions of the Manpower Development and Training Act, an on-the-job training program has provided commercial fishing training for 24 unemployed men.

The training program plus the cooperation between Federal, State, and municipal agencies have assured the success of the project, employed 24 men, and provided the Gloucester, Mass., fishing fleet with new workers in a tight labor market.

INTRODUCTION

Successful completion of an on-the-job training program under the Manpower Development and Training Act has made available 24 trainees skilled in the fundamentals of otter-trawl fishing as prospective fishermen for the trawlers of Gloucester, Mass.

Directed by the U. S. Department of Labor's Bureau of Apprenticeship and Training, the program provided vocational on-the-job training in the skills required by commercial fishermen aboard vessels of the North Atlantic fishing fleet. Development of the project was co-sponsored by the Gloucester Fishing Vessel Owners Association and the Atlantic Fishermen's Union (AFL-CIO). Federal, State, and municipal agencies directly concerned with the program included the U. S. Bureau of Commercial Fisheries, Massachusetts Division of Employment Security, and the Gloucester Vocational School.

Under the provisions of the Manpower Development and Training Act, the Federal government bore all costs of the training program, including the subsistence and transportation allowances of the trainees. Additional project costs included salaries for two instructors, procurement of supplies and materials for net-loft training, procurement and supply to each trainee of personal and foul-weather gear for use on shipboard, and premium costs for liability insurance in Protection and Indemnity coverage for all trainees. Personal and foul-weather gear included rubber boots, oilskins, oil hat, work gloves, and mattress. Trainees were required to supply their own work clothes and blankets.



Fig. 1 - Medium fishing vessel operating as a scallop dredger or otter trawler from New England fishing ports.

SELECTION OF TRAINEES

The applicants were first screened by the Massachusetts Division of Employment Security. To qualify for the training, applicants had to be either unemployed or underemployed (working less than 40 hours weekly), head of a family or household, strong and in good health, and

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willing to work at sea on board fishing vessels during most of the training period. The trainees had been laborers, welders, painters, shipping clerks, machine operators, and electrician's helpers. Although desirable, previous fishing or maritime experience was not required of the applicants, and only 5 of the 34 men selected for the course had previous experience either on fishing boats or merchant ships.

The program began August 3, 1964, with a class of 34 trainees and ended November 20, 1964, with a total of 24 persons completing the full course of instruction.

Average age of the group was 33 years--considerably lower than the average age of the commercial fishermen operating in the otter-trawl fishery out of the port of Gloucester and Boston, Mass. (table).

Classification of Commercial Fishing Trainees by Age Groups	
Years	Number
Under 25	5
From 25 to 29	4
" 30 to 34	8
" 35 to 39	2
" 40 to 44	3
" 45 and over	2

COURSE OF INSTRUCTION

The training period was 16 weeks--13 weeks of on-the-job training at sea on board fishing trawlers and 3 weeks of supplemental training ashore under the guidance of instructors skilled in the arts of fish-net assembly and repair, and in the splicing of wire and rope. The shoreside training was scheduled for a 2-week period prior to sea duty, plus a week of instruction in the net loft during the final period of the course.



Fig. 2 - Group of trainees at wharf during instruction in fishing vessel safety.

During the first week of the training, under the direction of the Fishing Vessel Safety Unit of the U. S. Bureau of Commercial Fisheries, the trainees were given an intensive course in the basic principles of fishing vessel safety. Safety instruction included inspection of selected fishing vessels, explanation of the use and function of fishing gear employed aboard otter trawlers, general briefing on safe operating practices, and enumeration of unsafe conditions and hazards apt to be encountered on shipboard during their tour of sea duty.

SHORE TRAINING: Shore training included over 100 hours of instruction in handling fish nets, wires, ropes, and accessory fishing gear used in the otter-trawl fishery. Emphasis was devoted to the fundamentals of trawl assembly, rigging of floats, rollers, and accessories for otter-trawl nets, and the splicing of wire and wire rope. Additional phases of the instruction covered such operations as serving and parceling wire rope, marking maintrawling wires, and tying simple knots widely used on board fishing vessels.

SEA TRAINING: Most of the training program was carried out at sea on board Gloucester trawlers working under actual fishing conditions. Forty-nine fishing vessel owners and captains participated in the program and made their vessels available to carry and instruct the trainees under on-the-job conditions.

The trainees were not classed as regular crew members but rather as supernumeraries,



Fig. 3 - Instructor counsels trainees in the art of fish net repair.

assisting the crew in all possible ways while obtaining experience and skill in the duties of otter-trawl fishermen.

The trips varied from 4 to 20 days depending on the fishery, the availability of fish, and weather encountered. Boats operating in the fisheries for whiting and groundfish on in-shore fishing grounds made short trips of 2 to 8 days. Vessels in the ocean perch fishery, working fishing areas 300 to 600 miles from Gloucester, averaged 12 days per trip. The program instructors scheduled training trips so that the trainees would serve on vessels in the whiting, groundfish, and ocean perch fisheries.

While the progress of the trainees in acquiring fishing skills depended in great part on the individual's initiative and capability, shipboard instruction was generally directed towards:

1. Quartermaster duties--standing regular wheel and lookout watch with crew members while the vessel was traveling to and from the fishing grounds.
2. Rigging otter-trawl nets and accessory fishing gear prior to setting the nets.
3. Setting and hauling otter-trawl nets.
4. Culling, dressing, and washing fish catches.
5. Icing fish catches in vessel's hold.
6. Unloading fish catches and preparing fish hold for next trip.
7. Servicing fish nets and gear in preparation for next trip.

BENEFITS OF THE PROGRAM

The combination of shoreside instruction in fishing skills and experience at sea on-the-job has added 24 trained men capable of handling the arduous duties of fishermen on board fishing trawlers in the North Atlantic waters. The program, at a cost to the Federal Government of less than \$800 per trainee, has removed men from the ranks of the unemployed, qualified them for employment in a trade where the fishermen have averaged earnings of from \$6,000 to \$6,500 per year, and provided new recruits for an industry plagued by an extreme shortage of competent workers.

Indoctrination of the trainees in the fundamentals of fishing vessel safety was the first time that safety instruction was included in a training project of the Manpower and Development Training Act. The immediate purpose of the instruction was to minimize the possibility of personal injury by pointing out the hazards associated with commercial fishing operations and creating a positive attitude towards accident prevention on the part of trainees. The accident-free work record of the trainees established during the training period indicates the value of the safety instruction.



Fig. 4 - Trainees practice their skill in mending fish nets.



TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, JANUARY 1965:

U.S.S.R.: The Soviet trawling fleet which had been operating in the general vicinity of Yakutat consisted of about the same number of vessels through January 1965 as in the previous month of December 1964. Some 15 vessels made up that fleet. It was the first time the Soviets have maintained fishing operations during the winter months in the Gulf of Alaska.



Fig. 1 - Soviet salvage tug in Bering Sea.

It was believed that by the end of January more than 100 vessels in the Soviet fleet were operating generally northwest of the Pribilof Islands in the Bering Sea, reportedly fishing for herring.

Japan: The Japanese shrimp factoryship Chichibu Maru, accompanied by 9 trawlers, returned to the Bering Sea during January and resumed fishing for shrimp north of the Pribilof Islands.



Fig. 2 - Japanese supply ship in Bering Sea.

The large factory stern trawler Aso Maru which had been fishing in the Aleutian Islands reportedly returned to Japan briefly during the month. According to Japanese sources, the vessel Aso Maru, accompanied by one small trawler, was scheduled to sail from Japan on January 21 for the eastern Bering Sea. Three other Japanese factory stern trawlers (the Akebono Maru's Nos. 71 and 72 and the Taiyo Maru No. 82) were also reported fishing in the eastern Bering Sea.

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GOOD SALMON RUN FORECAST FOR BRISTOL BAY IN 1965:

Preliminary data indicate that the 1965 sockeye salmon run to Bristol Bay may be the largest since 1960. The 1965 run could total between 20 and 24 million fish (with allowances for the Japanese high seas catch).



Alaska Bristol Bay salmon gill-net vessels docked at a cannery dock.

The Kvichak River run is expected to dominate the fishery as in the "dominant-year" Kvichak runs of 1956 and 1960. Most young sockeye produced by the spawning in 1960 remained in Lake Iliamna 1 year longer than normal. This has caused a 5-year interval between large runs on that cycle.

The preliminary forecast for Bristol Bay is based on studies of spawning from previous runs. This fresh-water information collected by the Alaska State Department of Fish and Game will be combined later with high seas data collected by other agencies to produce a final forecast of the 1965 Bristol Bay run of sockeye salmon. (Alaska Department of Fish and Game, January 6, 1965.)

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SALMON RUNS TO PRINCE WILLIAM SOUND AFFECTED BY 1964 EARTHQUAKE:

In the Prince William Sound area, direct salmon fry losses caused by the earthquake of March 27, 1964, are expected to result in about 330,000 fewer pink salmon in the 1965 run, and 50,000 fewer chum salmon in 1966, 1967, and 1968. Direct salmon fry losses from earth movement and gravel silting caused by the earthquake were relatively minor compared to over-winter mortalities from other sources.

The effect of land changes on subsequent salmon runs will probably be far more important than that caused by direct salmon fry losses in 1964. About two-thirds of the Prince William Sound area was uplifted with the elevation ranging from a few inches to 33 feet. By contrast, about one-tenth of the area dropped from 1 to 7 feet. Since pink and chum salmon in the Prince William Sound area spawn almost entirely in intertidal and immediately adjacent stream zones, adult salmon returning in 1964 were faced with highly altered and often unstable environments for egg deposition. Far fewer spawners used intertidal zones than in previous cycle years, but in the uplifted area 52 percent of the pink salmon spawners utilized riffle areas never before used for spawning. Egg sampling in October 1964 showed that eggs deposited in the "new" riffles were being lost at a fairly high rate compared to eggs in riffles formerly in use, mainly due to excessive erosion in the "new" riffle areas.

The unstable spawning conditions are expected to reduce salmon production for a short period, but the significant increase in spawning ground area caused by land uplift could add greatly to the potential in future years. (Alaska Department of Fish and Game, January 6, 1965.)



Alaska Fisheries Investigations

CHANGES IN KING CRAB ABUNDANCE OBSERVED BY SCUBA DIVERS:

During January 1965, SCUBA divers of the U. S. Bureau of Commercial Fisheries Auke Bay Biological Laboratory made several observations on adult king crab in the Auke Bay area. At the beginning of the month, female Paralithodes camtschatica and male and female P. platypus were observed in the Auke Bay Recreation area. At that time female P. platypus were most abundant. By the middle of the month, the divers were unable to locate any P. camtschatica, but reported that the abundance of male P. platypus was increasing. During the latter part of January, males (P. platypus) were more abundant than females. On at least one occasion, adult males (P. platypus) were concentrated into a group or "pod." The first mating pair of P. platypus was observed on January 24.



California

SILVER SALMON STOCKING PROGRAM TO CONTINUE:

Despite flood losses in December 1964, the program of stocking 500,000 silver salmon annually in California's north coastal streams is nearly back on schedule. The floods demolished the Cedar Creek Hatchery and carried away 370,000 silver salmon eggs and 120,000 yearling silver salmon. But 380,000 silver salmon yearlings at Darrah Springs Hatchery survived the floods and will be planted on schedule early in 1965 to maintain the stocking program.

In 1966, the planting of 500,000 yearling silver salmon will be made on schedule with stock from the Darrah Springs Hatchery and the Mt. Shasta Hatchery.

"By making above normal use of other facilities on a temporary basis we can maintain the silver salmon program despite loss of the Cedar Creek Hatchery," said the Director of the California Department of Fish and Game. "On a permanent basis, however, maintenance and expansion of the program will probably have to be accomplished at some location other than Cedar Creek since the hatchery site there seems too hazardous from the standpoint of floods to justify re-

building the installation." (California Department of Fish and Game, January 23, 1965.)

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SALMON PLANTING PROGRAM IN RUSSIAN RIVER:

The November 1964 planting of 50,000 eight-month-old early winter strain king salmon in the Russian River near Ukiah, Calif. completed the 2nd year of a 4-year cooperative Federal-State program. The program is aimed at establishing a self-sustaining run of kings in the Russian River system. The fish released in November 1964 were from the same hatch as the 500,000 fingerlings that were planted in May 1964. The larger fingerlings have all been marked as a means of checking their return to the river at a future date.

Earlier efforts to establish a fall run of king salmon in the Russian River failed because the adult fish returned to the river at the time when water conditions were unfavorable to successful spawning. Because of that problem, a winter strain of king salmon was introduced in May 1963. At that time 500,000 fingerlings were planted. That was followed in November 1963 with an additional 50,000 marked, larger-sized fingerlings of the same hatchery brood.

It is hoped that the early winter strain will adapt to the Russian River and develop a self-maintaining population.

Salmon fingerlings for the Russian River program are being supplied by the Coleman National Fish Hatchery. (Outdoor California, January 1965.)

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PELAGIC FISH POPULATION SURVEY CONTINUED:

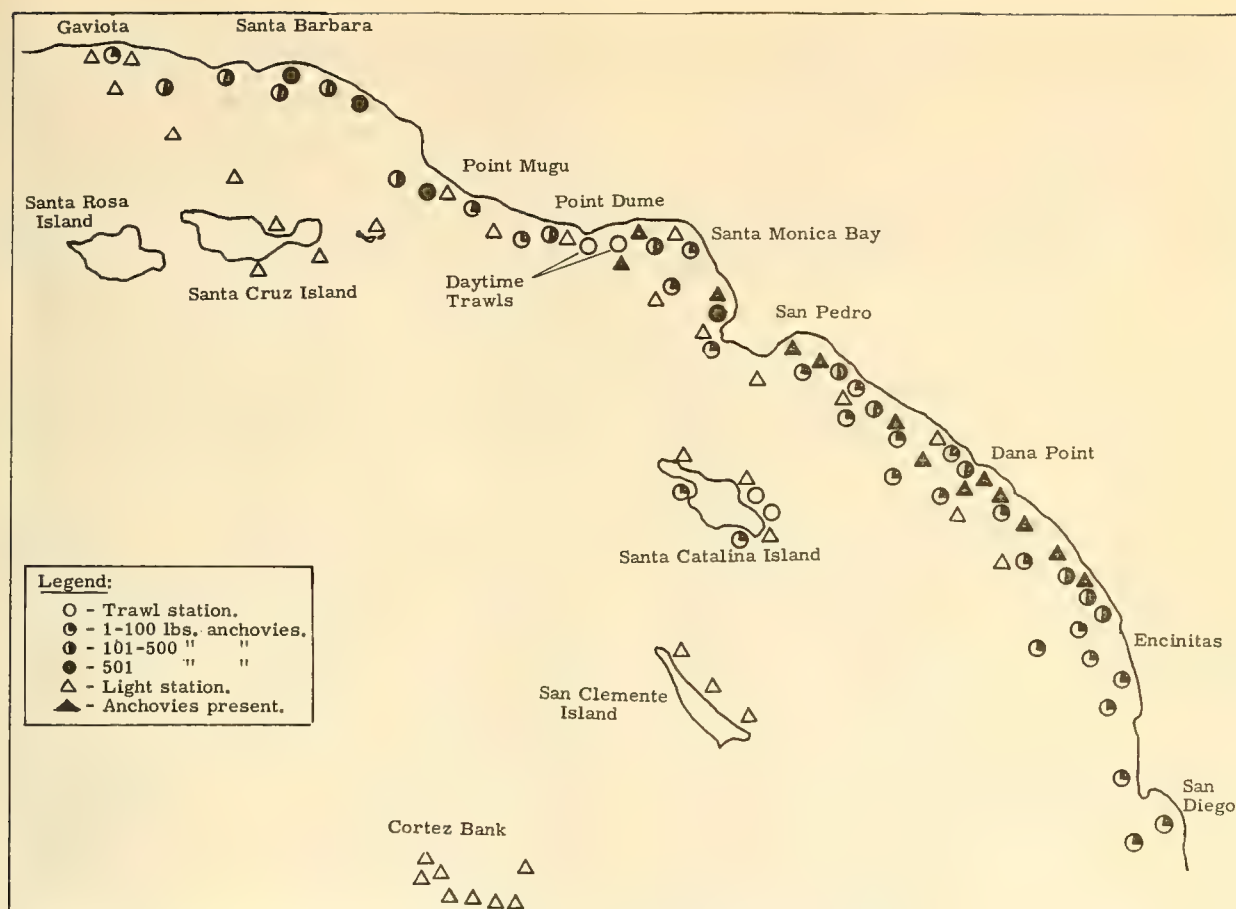
M/V "Alaska" Cruise 64-A8-Pelagic Fish (October 26-November 16, 1964): The purpose of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters, islands, and banks of southern California from Gaviota to Cortez Bay was to: (1) survey the pelagic species to determine population densities and to ascertain age and size compositions; (2) assess sardine spawning success for the year 1964; and (3) make underwater measurements and observations of the midwater trawl using different nets, doors, and towing speeds.

The area covered was surveyed by occupying selected midwater trawl and blanket-net-nightlight stations. Both types of stations were occupied in the same general localities whenever practical. Almost all work was conducted at night. A total of 47 blanket-net and 46 midwater-trawl stations were occupied.

Northern anchovies (Engraulis mordax) as usual were by far the dominant species caught. They were taken in all but 4 midwater trawls and were present on 13 blanket-net stations. Jack mackerel (Trachurus symmetricus) were caught in 11 midwater trawls and Pacific sardines (Sardinops caeruleus) in 4. The blanketnet took 1 sardine and 3 jack mackerel samples. Visual scouting between stations totaled 373 miles. Bonito (Sarda chiliensis) surface schools consisting of 3 to 12 fish were frequently sighted north of San Pedro; no other fish schools were seen.

NORTHERN ANCHOVIES: Anchovies were distributed along the entire coastline from San Diego to Gaviota. All midwater trawls made after dark in that area were successful. The heaviest concentrations of fish were located from Santa Monica Bay northward, where substantial catches and dense echo-sounder traces were made. The best catches were made in water 10 to 35 fathoms deep and over submarine canyons near shore. The offshore islands and banks yielded only 1 anchovy in each of 2 catches. Small fish ranging in size from 60- to 110-millimeters (2.4 to 4.3 inches) body length were present close inshore south of Santa Monica Bay. A few samples of larger fish were caught farther offshore. From Santa Monica Bay northward a high percentage of the fish were over 125 millimeters (4.9 inches) long. The scattered schooling behavior observed on previous cruises was prevalent. No dense schools were seen visually, and no compact traces appeared on the echo-sounder.

During daylight hours, anchovy traces appeared as a thin fuzzy border along the bottom. As darkness approached they rose to form a bank 20 to 50 feet thick, in a depth range of 20 to 120 feet below the surface. The darker the night, the closer the fish approached the surface. Behavior beneath the nightlight in deep water was observed on the echo-sounder. The fish would remain 150 to 200 feet deep with the light at full brightness. When the light was dimmed to almost



Alaska Cruise 64-A8-Pelagic Fish (October 26-November 16-1964).

complete extinction the anchovies would rise to the surface briefly and then descend 50 to 100 feet.

Southern California waters appeared to have a considerably larger anchovy population in 1964 than Baja California, Mexico. The quantity of fish per tow was much higher than on any of the surveys made in Mexico and echo-sounder traces were heavier and more extensive.

JACK MACKEREL: Catches of jack mackerel were small, usually consisting of a few juvenile specimens mixed with larger amounts of other species. Midwater trawling took 11 samples and the blanketnet 3. Nightlight stations on Cortez Bank failed to attract fish on the same night that over 300 tons were caught by the commercial fishing fleet. The fish were concentrated in a small area and could be seen only by aerial fish spotters.

PACIFIC SARDINES: Sardines were taken in 4 midwater trawls and on 1 nightlight station. All were large adults and were caught in minor quantities from San Pedro to San Diego. The 1964 sardine year-class appeared to be totally lacking in southern California.

OTHER SPECIES: No Pacific mackerel (*Scomber diego*) were caught or seen. Juvenile Pacific hake (*Merluccius productus*) ranging in length from 93 to 157 millimeters (3.7 to 6.2 inches) were caught mixed with anchovies south of San Pedro. They were taken in 6 midwater trawls in numbers ranging up to 440 fish. Extensive heavy concentrations of salps in offshore and island waters curtailed trawling because of severe net clogging.

Underwater measurements of the trawl mouth showed that the best net opening and shape was attained by using 4 hydrofoil doors and the standard net. An optimum opening 40 feet across the float line, 30 feet across the

lead line, and 43 feet between float and lead-line was obtained. Very little effect was noted by decreasing the towing speed from 3 to 2 knots except that the net fished deeper at the slower speed.

Sea surface temperatures ranged from 11.6° C. (52.8° F.) at Point Mugu to 18.7° C. (65.6° F.) at Encinitas. Three days of work were lost because of strong winds during the last week of the cruise.

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To determine the inshore distribution and abundance of pelagic fish schools, the following spotting flights were made by aircraft of the California Department of Fish and Game:

Airplane Spotting Flight 64-16-Pelagic Fish (November 9 and 11, 1964): The area from Point Conception to the United States-Mexican Border was surveyed by the Cessna "182" N9042T during this spotting flight. The southern California area was subjected to a series of rain storms during the flight and visibility was generally poor.

On the November 9 flight the area from Point Conception to La Jolla was scouted, with rainstorms occurring at La Jolla and Port Hueneme. Two killer whales (Orcinus orca) were seen north of Point Dume about one-quarter mile from the beach. Red tide was in evidence only in the southern part of Santa Monica Bay.

Weather conditions were very poor north of Santa Barbara during the November 11 flight when the area from Santa Barbara to the United States-Mexican Border was scouted. Two small fish schools were seen. The school seen at Newport Beach was not identified. The other was a school of Pacific bonito (Sarda chiliensis) in Santa Monica Bay. Red tide was noticed at La Jolla, Newport Beach, and Santa Monica Bay.

* * * * *

Airplane Spotting Flight 64-17-Pelagic Fish (November 18-20, 1964): The area from Tijuana to Rancho Inocentes and La Paz to San Felipe, Baja California, was surveyed by the Beechcraft N5614D during this spotting flight. It was the last of four (quarterly) experimental survey flights along the coast of Baja California on the distribution and abundance of pelagic fish schools in that area.

On the first day of the flight the area from Tijuana to Cabo San Lazaro was scouted. Air and sea visibilities were fair between Tijuana and the northern section of Bahia Vizcaino but occasional clouds obscured the sea's surface. A zig-zag search pattern was flown throughout Bahia Vizcaino out to and including the waters around Isla de Cedros. Poor flying conditions caused cancellation of the pattern near Scammons Lagoon. One unidentified surface school and 6 Pacific sardine (Sardinops caeruleus) schools were noted in Bahia Vizcaino. The survey was resumed at Punta San Hipolito. Aerial visibility was excellent and between that point and Cabo San Lazaro, 101 northern anchovy (Engraulis mordax) schools were sighted near the surf line. Two sardine schools were also sighted.

The area from Boca de las Animas to Rancho Inocentes was scouted on the second day. Air and water visibilities were limited by scattered cumulus clouds which cast shadows on the water surface, and by a surface wind which created white caps. A total of 11 anchovy and 6 unidentified fish schools were sighted up to 10 miles offshore between Boca de las Animas and Cabo San Lazaro. In Bahia de Magdalena, over 300 anchovy schools were seen along the eastern shore, the same area where anchovy schools were observed in September 1964. Ten sardine and 12 anchoveta (Cetengraulis mysticetus) schools were also seen in Bahia Magdalena.

On the last day of scouting the entire gulf side of the peninsula was surveyed for the first time during this series of spotting flights. Water visibility was poor due to a steady north wind throughout the area surveyed, although 6 unidentified schools were seen close to shore in calm bays.

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Airplane Spotting Flight 64-18-Pelagic Fish (December 14 and 17, 1964): The area from Santa Monica to Santa Cruz Point was surveyed by the Cessna "182" N9042T during the December 14 flight. Visibility was excellent throughout the area flown. The ocean's surface was quite calm, especially north of Point Conception. A large northern anchovy (Engraulis mordax) school group was seen near the surf line at Santa Monica. Anchovy schools were also seen at Malibu, Port Hueneme, Estero Point, and Piedras Blancas. Four Pacific bonito (Sarda chiliensis) schools were

spotted near Point Conception. Red tide was noted from Port Hueneme to Santa Barbara.

The area from Jalama Park to the United States-Mexican Border was surveyed on December 17. Visibility was quite good. Two unidentified fish schools were seen near San Onofre and several small school groups of anchovies were again found in the Santa Monica and Port Hueneme areas.

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SURVEY OF CRAB AND SHRIMP RESOURCES IN COASTAL WATERS CONTINUED:

M/V "N. B. Scofield" Cruise 64-S-7-Crab and Shrimp (November 4-25, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel N. B. Scofield in coastal waters from Avila to Crescent City were to: (1) determine pre-season abundance and condition of legal and sublegal crab (Cancer magister) in the Eureka-Crescent City area for prediction of the 1964-65 season; (2) collect gravid shrimp (Pandalus jordani) from beds off Avila, Bodega Bay, Fort Bragg, and Redding Rock for fecundity studies; (3) collect hake (Merluccius productus) and arrowtooth halibut (Atheresthes stomias) stomachs for juvenile shrimp abundance studies; and (4) tag sublegal male crab for growth studies.

During the cruise, 10 commercial crab traps were fished overnight at 35 randomly selected stations, 10 traps were fished 5 days and nights at 5 random stations, and 9 traps were fished overnight at one random station in productive crab areas between Crescent City and the mouth of the Eel River, Calif. Shoulder widths of crab were recorded for the entire catch taken on the cruise and shell condition determinations were made for all male crab.

A total of 12 shrimp net tows lasting 10 minutes each was made off Eureka, Fort Bragg, Bodega Bay, and Avila to catch gravid female shrimp.

Poor weather did not permit completion of all random stations chosen and prevented retrieval of the first set for 5 days. The catch-per-unit-of-effort for those 50 traps was corrected to one day's catch. No traps were lost. A total of 7,019 crabs was caught in the 409 trap sets. The catch consisted of 4,735 legal males (7 inches or over in breadth), 2,250

sublegal males, and 33 females. The average catch-per-trap of legal males was 11.6 and for sublegal males 5.5. The average was 7.7 legal males per trap at 25 stations between Crescent City and Patrick's Point, and 17.6 legal males per trap at 16 stations between Trinidad and the mouth of the Eel River. The highest station catch was recorded southwest of Trinidad Head where 27.0 legal males per trap were caught.

The legal crab caught were in good condition between Crescent City and Patrick's Point where only 2.6 percent were soft. An average of 9.6 percent of the legal crab in the area from Trinidad to the mouth of the Eel River were soft.

Based on the survey made so far in 1964 and the 1963 total catch and preseason survey, the total catch for northern California should range between 3.7 and 5.8 million pounds.

A total of 34.0 percent and 1.1 percent of the sublegal and legal males, respectively, had mating marks. Only 45.5 percent of the females were gravid. Sublegal males tagged and released off Humboldt Bay totaled 299. The crab were tagged with a suture tag designed to be retained when molting occurs. The tagging is part of a study of growth rates for male crab from 100-millimeter (3.9 inches) shoulder width to legal size. Nine sublegal males with experimental suture tags were placed in a local commercial aquarium for observation.

Two shrimp tows each in Areas A (Eureka) and B-1 (Fort Bragg) yielded 500 egg-bearing females. Another 150 gravid female shrimp were taken in Area B-2 (Bodega Bay) in 4 tows. The shrimp were not plentiful in that area but some females had spawned. The 4 tows in Area C (Avila) did not yield adult shrimp in good quantity in all areas.

Hake and arrowtooth halibut stomachs from 120 fish were collected for studies of the abundance of juvenile shrimp in the food of those species.

In cooperation with the International Shark Tagging Program, 7 dogfish (Squalus acanthius) and 3 brown smoothhound (Rhinotriacis henlei) were tagged and released.

Note: See Commercial Fisheries Review, March 1965 p. 23.

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SAN FRANCISCO BAY INVESTIGATIONS CONTINUED:

M/V "Nautilus" Cruises 64-3f-g-h-i-j S. F. Bay Study (August 12-16, September 8-11, 14-15, October 8-9, 13-16, November 5-6, 9-13, December 8-11, 14-15, 1964): Studies in San Francisco Bay were resumed with these cruises by the research vessel Nautilus of the California Department of Fish and Game. Objectives were to: (1) collect fish species and invertebrates routinely at six stations, (2) determine distribution and relative abundance under prevailing environmental conditions, (3) define ecological zones of the Bay, and (4) determine the food organisms of the principal species and their availability.

The six stations worked in the Bay study area had an average depth ranging from 15 to 50 feet.

During the cruise a square-mouthed mid-water trawl 25 feet on a side was towed for 20 minutes at the surface. Each station was also sampled by a 20-minute bottom tow with a 15-foot otter trawl having 1-inch mesh. Plankton tows of 20 minutes were also made at each station with a one-half meter net having 32 meshes per inch.

A total of 64 different fish species have been taken since the study began in February 1963, 20 of them from south of Dumbarton Bridge.

Four days of this cruise were spent assisting the regional Water Pollution Control Board and cooperating agencies in sampling the Bay waters south of Dumbarton Bridge. Two days were used collecting bottom samples from the same area for a wild fowl food study being made by the Department of Fish and Game. Information and material was collected for a study being made at the University of California on the papillomas which appear on English sole that inhabit sewage contaminated areas.

Water temperatures during this cruise were neither as high nor as low as in 1963 but remained in the range of 11° to 20° C. (51.8° to 68.0° F.). The range in 1963 was 9° to 21° C. (48.2° to 69.8° F.). Salinity was much more stable than in 1963.

Note: See Commercial Fisheries Review, November 1964 p. 21.



Central Pacific Fisheries Investigations

ADVANCES MADE IN TUNA BLOOD GROUP STUDIES:

Long-term basic studies of blood groups in tuna have been made for several years by the Subpopulations Program of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The aim of the studies is to facilitate identification of isolated breeding subpopulations of tunas through the use of blood groups, which serve as genetic markers that are not affected by environment. Provided with such a tool, fishery research biologists will be able to make much more precise analyses of local fishery management problems and world-wide fishery resources as well.



Taking a blood sample from a skipjack tuna.

Two recent technological advances have made possible striking advances in the field of blood group research and its application to the identification of subpopulations. The first breakthrough came with the development of improved techniques for preserving tuna bloods for extended periods by freezing them in a glycerol solution. Those techniques now make it possible not only for the Bureau's Laboratory to preserve specimens over long periods, for use in standardization of reagent, but also presents the possibility of establishing a blood bank of particular blood types for each species of tuna. From such a bank, samples can be sent to other researchers in this field for use in comparison and standardization.

The second major advance has been the recognition of a new blood group system in skipjack tuna. This new system has been temporarily named the YS blood group system and consists of three blood groups--Y, YS, and S--which are detected by the interaction of two reagents, anti-Y and anti-S. The reactions that distinguish those blood groups are shown in the table. The plus sign (+) in-

YS Blood Group System		
Blood types	Reagents	
	Anti-Y	Anti-S
Y	+	-
YS	+	+
S	-	+

icates the presence of a particular blood factor, and the minus sign (-) indicates its absence.

The significant feature of the new blood group system is that the genetic relationships responsible for those blood types can be established directly from the Hardy-Weinberg formula. This fact also makes it possible to perform statistical analysis of skipjack population samples and determine whether these samples were taken from a pure isolated breeding population or from a mixed group.

With the use of the two new discoveries and vigorous pursuit of the present basic program, it is hoped that in the near future knowledge of the population structure of all tuna in the Pacific area will be greatly increased. Such information concerning the skipjack would be most significant, since at present the potential of that tuna species is not fully realized.

Note: See Commercial Fisheries Review, November 1964 p. 26.

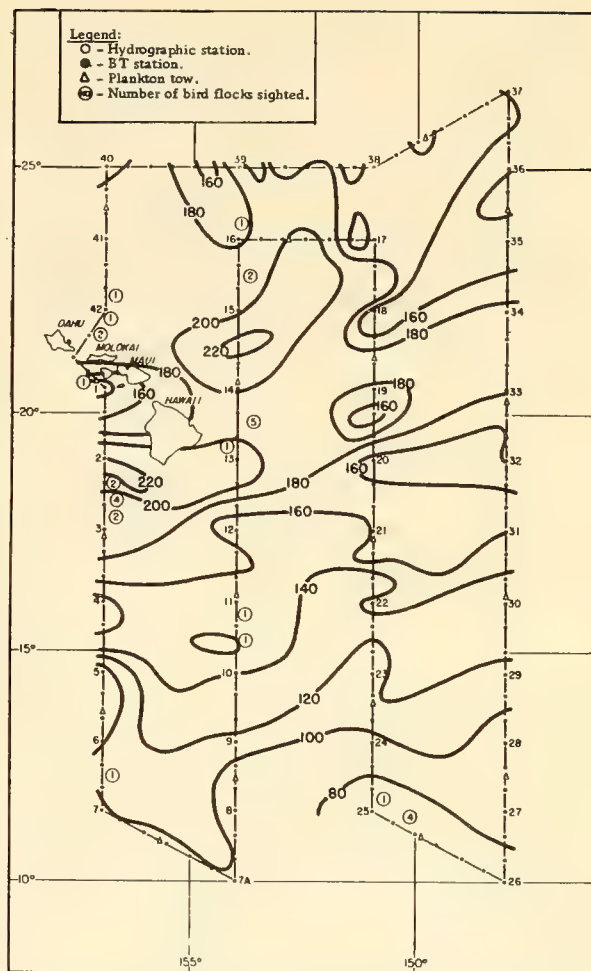
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TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell Cruise 12 (January 5-24, 1965): This was the eleventh in a series of oceanographic cruises by the research vessel Townsend Cromwell to collect data on rates of change in the distribution of properties in the trade wind zone of the central North Pacific Ocean. The research vessel is operated by the Biological Laboratory of the U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii, which on this cruise operated and collected data in an area of the central North Pacific bounded by latitudes 10° N., 27° N. and longitudes 148° W., 158° W.

A total of 43 oceanographic stations was occupied along the cruise track. At each station, temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). Deep casts to 4,000 meters (13,123 feet) were taken at stations 25, 38, and a cast to 3,000 meters (9,482 feet) was taken at station 21.



Track chart of M/V Townsend Cromwell Cruise 12 (January 5-24, 1965) showing depth contours of the 20° C. isotherm depth in meters.

Oceanographic conditions in January 1965 appeared to be nearly the same as for December, although some changes had occurred. Over the entire cruise area, the depth of the 20° isotherm was nearly 20 meters (66 feet) greater than in the previous month of December. It was even greater in the southern portion which indicates further relaxation of the westerly flow. The flow pattern, however, was nearly the same as in December. In the north, there was a new set of well-formed eddies, with maximum depths of the 20° isotherm greater than appeared in December. The distribution of those eddies was different than seen before with one exception. The clock-wise eddy centered near 18° N. and 157° W., which first appeared in October 1964, has remained and now covers a larger area. This is reflected in the temperature section

by a much deeper mixed layer than normally occurs in that region. The overall cooling of the surface waters seems to have ceased with the temperature distribution nearly the same as in December. The surface salinity was not as low in the south as it was in December while the rest of the pattern is nearly the same.

Total feeding-bird flocks increased from 20 in December to 30 in January. Almost all of them were found either within 200 miles of Oahu or in the southeast corner of the cruise area. The total number of birds seen on this cruise was more than double that seen in the area in December.

Also, other operations included the usual series of bathythermograms, surface bucket temperatures, water samples for salinity analysis, release of drift bottles, and other oceanographic data collection.

Note: See Commercial Fisheries Review, March 1965 p. 27.



Federal Purchases of Fishery Products

NEW PURCHASING SPECIFICATIONS FOR SHUCKED OYSTERS:

A revised "Deviation List" for raw shucked oysters, fresh (chilled) or frozen, purchased by the U. S. Defense Department was announced by the Defense Subsistence Supply Center. The revised "Deviation List" includes specifications and standards for shucked oysters. It will be effective with purchase contracts awarded on and after March 1, 1965.



Florida

NEW MARINE LABORATORY FOR UNIVERSITY OF MIAMI:

Construction has begun on a new million-dollar laboratory building at the Institute of Marine Science, University of Miami. Construction costs in the amount of \$1,040,000 will be paid by the National Science Foundation. The new building will house the Institute's Division of Physical Sciences, which investigates ocean currents, waves, tides, the sea floor and underlying layers, and other factors in the marine world. Such research includes studies of underwater sound and

light, the chemistry of sea water and deep-sea sediments, and the distribution of radioactive elements in sea water. With the construction of the new building, to be completed by early fall of 1965, many of the activities of those various research programs will be concentrated in a single location.

The new 3-story laboratory building will have more than 40,000 square feet of working space. The ground floor will contain model basins and pressure tanks and will include space for a rotating tank and a soundproof chamber. The tanks will simulate certain conditions of the open sea for experimental purposes. Second and third floors will house offices and laboratories, as well as classrooms, a computer room, chartroom, draftroom, and a communications center for maintaining radio contact with the Institute's fleet of vessels. The Institute owns and maintains more than 20 research vessels and small craft, including two ocean-going vessels, Pillsbury and Gerda, which frequently range thousands of miles from their home port, working in both eastern and western Atlantic waters.

Established in 1943, the Institute of Marine Science now occupies a 5½-acre tract on Virginia Key near Miami, Fla., and employs more than 300 scientists, technicians, and administrative employees. Next fall the entire Virginia Key campus will be officially dedicated, with ceremonies featuring educators, oceanographers, and government leaders from all over the world. (University of Miami, January 27, 1965.)



Frozen Food

PACKERS CONVENTION HELD IN SAN FRANCISCO:

The 24th Annual Convention of the National Association of Frozen Food Packers was held in San Francisco, Calif., February 28 to March 3, 1965. All sections of the frozen food industry were represented at the convention including brokers, distributors, retailers, warehousemen, transportation people from both the rail and trucking industries, suppliers, and packers.

The theme was "Zero-in on Tomorrow." The program of the convention emphasized specific ways to increase sales in both the retail and institutional markets.

Time magazine sponsored one of the general sessions at the convention. Representatives from Time conducted the audience through a unique slide show to demonstrate seven distinct types of consumer markets for frozen foods. The presentation included an up-to-the-minute look at what consumers are buying, based on a survey made in 1965 just before the convention. Other general sessions heard retail and institutional specialists discuss ways of improving sales.

Technical sessions of the convention included discussions of new research developments such as: (1) freeze-drying and (2) liquid nitrogen processing for frozen foods. Technical sessions also brought together transportation executives and frozen food packers to discuss current problems and future needs in transportation of frozen foods.

An interesting feature of the convention was a display of the latest in equipment, services, and supplies available to frozen food packers. Leading United States manufacturers displayed their products at the exposition.



Great Lakes

SALMON STOCKING WORK CONTINUES:

Another 500,000 fertilized silver or coho salmon eggs were flown to Michigan in February 1965, stepping up the Michigan conservation Department's opening efforts to add this western species to the Great Lakes. The February shipment of eggs was donated by the State of Washington. It matches a January 1965 shipment of 500,000 coho eggs from Oregon.

Survivors from the total batch of 1 million salmon eggs will be released next fall or in the spring of 1966 as "seed" stock in northern tributaries of the Great Lakes where their chances of spawning are expected to be best.

Other introductory plantings are scheduled for each of the following 2 years in hopes that these hard-fighting game fish will take hold and develop spawning runs from which Michigan can get its own source of coho eggs for future releases. (Michigan Department of Conservation, February 4, 1965.)

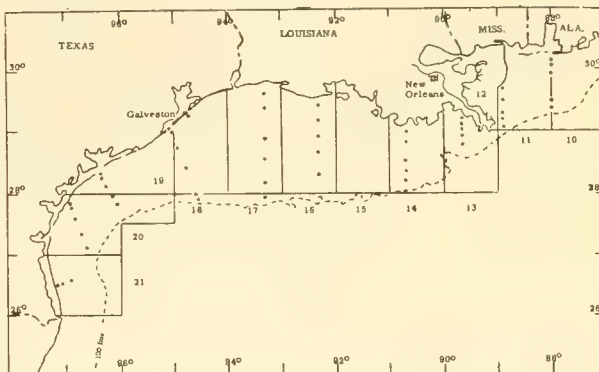
Note: See Commercial Fisheries Review, March 1965 p. 33.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-25 (January 6-18, 1965): Trawling operations during this shrimp sampling cruise in the Gulf of Mexico by the chartered research vessel Gus III sampled only the white shrimp fishery (4 to 15 fathoms) and the brown shrimp fishery (15 to 25 fathoms). This cruise was one of a series in a continuing shrimp distribution study by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-25.

Six statistical areas off the Louisiana coast to Texas were covered and standard 3-hour tows with a 45-foot Gulf shrimp trawl were made. A total of 18 flat-trawl and 90 plankton tows were made, 62 bathythermograph and 167 water (Nansen bottle) samples taken, and 167 drift bottles were cast at 27 stations.

Fair catches of small brown shrimp (41-50 count) were made in the 10-20 fathom depth range of area 18. The over 20-fathom depth in area 20 yielded 19 pounds of 21-25 count brown shrimp, and 7 pounds were taken from the 10-20 fathom depth of the same area. The largest white shrimp catch of the cruise (30 pounds of 51-67 count) was from the tow in the up to 10-fathom depth of the same area.

Area 13 yielded 47 pounds of small white shrimp counting from 51 to 68 shrimp to the pound--22 pounds from the up to 10-fathom depth and 27 pounds from the 10-20 fathom depth range. A total of 9,000 white shrimp (51-67 count) was caught in areas 13 and 20.

The up to 10-fathom depth of areas 17, 18, and 19 yielded only fair catches of small

white shrimp ranging from 8 to 9 pounds per tow.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, March 1965 p. 35.



Gulf States Marine Fisheries Commission

ANNUAL SPRING MEETING HELD IN MOBILE:

The Gulf States Marine Fisheries Commission held its annual shrimp meeting in Mobile, Ala., March 18-19, 1965. The General Sessions of the Meeting featured discussions and reports by industry representatives and officials of Federal and State Fisheries agencies.



Industrial Fishery Products

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, 1963-64: Based on domestic production and imports, the United States available supply of fish meal for 1964 amounted to 648,079 short tons--15,851

tons (or 2.5 percent) more than during 1963. Domestic production was 46,941 tons (or 18.3 percent) less, but imports were 62,792 tons (or 16.7 percent) higher than in 1963. Peru continued to lead other countries with shipments of 348,025 tons.

The United States supply of fish solubles during 1964 amounted to 87,439 tons--a decrease of 23.6 percent as compared with 1963. Domestic production dropped 22.8 percent and imports of fish solubles decreased 36.7 percent.

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U. S. FISH MEAL, OIL, AND SOLUBLES:

Production, December 1964: During December 1964, a total of about 5.8 million pounds of marine animal oils and 7,287 tons of fish meal was produced in the United States. Compared with December 1963 this was a decrease of 609,000 pounds of marine-animal oils and 2,668 tons of fish meal and scrap. Fish solubles production amounted to 2,595 tons--a decrease of 931 tons as compared with December 1963.

Menhaden oil production amounted to 5.3 million pounds--a decrease of 49,000 pounds. Menhaden fish meal and scrap production in December 1964 amounted to 4,957 tons--a decrease of 1,290 tons as compared with the same month of 1963.

U.S. Supply of Fish Meal and Solubles, 1963-64		
Item	1/1964	1963
	... (Short Tons) ...	
Fish Meal and Scrap:		
Domestic production:		
Menhaden	151,991	184,205
Tuna and mackerel	26,324	26,957
Herring, Alaska	9,372	7,537
Other	21,279	37,208
Total production	208,966	255,907
Imports:		
Canada	54,739	50,985
Peru	348,025	285,414
Chile	12,942	23,567
Norway	-	1,819
So. Africa Republic	18,581	12,296
Other countries	4,826	2,240
Total imports	439,113	376,321
Available fish meal supply	648,079	632,228
Fish Solubles:		
Domestic production 2/	82,934	3/107,402
Imports:		
Canada	1,553	2,233
Iceland	-	160
So. Africa Republic	987	511
Other countries	1,965	4,208
Total imports	4,505	7,112
Available fish solubles supply	87,439	114,514
1/Preliminary.		
2/50-percent solids.		
3/Includes production of homogenized condensed fish.		

U. S. Production of Fish Meal, Oil, and Solubles, December 1964 1/ with Comparisons						
Product	Dec.		Nov.		Jan.-Dec.	
	1/1964	1963	1/1964	1963	1/1964	1963
	(Short Tons)					
Fish Meal and Scrap:						
Herring	2/	29	295	16	9,372	7,537
Menhaden 3/	4,057	6,247	5,387	8,778	151,991	184,205
Tuna and mackerel	1,687	3,143	2,026	3,745	26,324	26,957
Unclassified	643	536	1,214	777	21,279	22,415
Total	7,287	9,955	8,922	13,316	208,966	241,114
Shellfish, marine-animal meal and scrap	4/	4/	4/	4/	4/	14,793
Grand total meal and scrap	4/	4/	4/	4/	4/	255,907
Fish Solubles:						
Menhaden	1,692	2,223	1,838	3,324	64,307	74,831
Other	903	1,303	1,013	1,562	18,627	25,347
Total	2,595	3,526	2,851	4,886	82,934	100,178
Homogenized condensed fish	-	-	-	-	-	7,224
	(1,000 Pounds)					
Oil, body:						
Herring	2/	294	-	279	9,986	5,709
Menhaden	5,793	5,342	6,077	9,195	148,913	167,635
Tuna and mackerel	240	523	490	439	5,642	5,903
Other (including whale)	252	235	211	176	6,207	6,580
Total oil	5,785	6,394	6,778	10,089	170,648	185,827
1/ Preliminary data.						
2/ Included in "Unclassified."						
3/ Includes a small quantity of thread herring.						
4/ Not available on a monthly basis.						

1/Preliminary data.
2/Included in "Unclassified."
3/Includes a small quantity of thread herring.
4/Not available on a monthly basis.

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Production by Areas, January 1965: Preliminary data on U. S. production of fish meal,

oil, and solubles for January 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, by Areas, January 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
January 1965:			
East & Gulf Coasts	725	313	63
West Coast 2/	1,680	223	1,051
Total	2,405	536	1,114
January 1964 Total	1,895	709	1,290

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes American Samoa and Puerto Rico.

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Major Indicators for U. S. Supply, December 1964: United States production of fish meal in December 1964 was lower by 26.8 percent as compared with December 1963. Production of fish oil was down by 9.5 percent and production of fish solubles decreased 26.4 percent.

Major Indicators for U.S. Supply of Fish Meal, Solubles, and Oil, December 1964					
Item and Period	1/1964	1963	1962	1961	1960
Fish Meal:	(Short Tons)				
Production:					
December 2/	7,287	9,955	2,683	12,763	9,178
Year 3/	208,966	255,907	312,259	311,265	290,137
Imports:					
December	37,793	29,729	18,977	23,268	15,564
Year	439,113	376,321	252,307	217,845	131,561
Fish Solubles:	(1,000 Lbs.)				
Production:					
December 2/	2,595	3,526	1,838	4,936	2,897
Year 3/	82,934	107,402	124,649	112,254	98,929
Imports:					
December	277	3,160	387	472	60
Year	4,505	7,112	6,308	6,739	3,174
Fish Oils:	(1,000 Lbs.)				
Production:					
December 2/	5,785	6,394	690	11,191	7,737
Year	107,648	185,822	250,075	258,118	209,143
Exports:					
December	11,120	33,262	172	10,484	15,807
Year	151,469	262,342	123,050	122,486	143,659

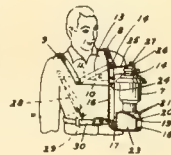
1/Preliminary.
2/Data for 1964 based on reports which accounted for the following percentage of production in 1963: Fish meal, 95 percent; solubles and homogenized fish, 99 percent; and fish oils, 99 percent.
3/Small amounts (10,000 to 25,000 pounds) of shellfish and marine animal meal and scrap not reported monthly are included in annual totals.
4/Includes homogenized fish prior to 1964--none produced in 1964.



Inventions

FISHERMAN'S PORTABLE LIGHT PATENTED:

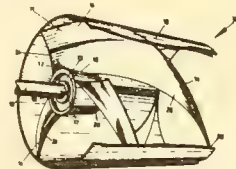
The inventor of a portable lantern for fishermen claims it can be carried on a shoulder harness without hampering normal movements. The lantern can be positioned so that the wearer avoids direct glare from the light. It is said to be of lightweight construction, easy to put on and fasten securely, and also easy to remove. (U. S. Patent No. 3,106,350 issued Charles F. Wiltse, 325 N. Center St., Sebawaing, Mich.)



* * * * *

MARINE PROPELLER WITH PROTECTIVE CASING PATENTED:

A recently patented marine propeller includes a cylindrical shroud-like casing which is welded or cast integral with the 2-or 3-blade propeller. The inventor claims the device protects the blades from impact with submerged objects. The inventor also says that the shroud, which tapers rearward, increases water flow past the propeller and eliminates cavitation. (U. S. Patent No. 3,148,736 issued Joseph Skopyk, 3911 Bloor Street West, Islington, Toronto, Canada.)



Maine Sardines

CANNED STOCKS, JANUARY 1, 1965:

Canners' stocks of Maine sardines on January 1, 1965, were down sharply from those of the same date in 1964 and 1963, but 394,000 cases above stocks on hand 3 years ago on January 1, 1962 (the pack for the 1961 season was exceptionally small).

Carryover stocks at the canners' level amounted to about 622,000 cases on April 15, 1964, which is the traditional opening date of the Maine sardine packing season. Carryover stocks amounted to 660,000 cases on April 15, 1963, but only 33,000 cases on April 15, 1962, following the short-pack year.

Canned Maine Sardines--Wholesale Distributors' and Cannery Stocks, January 1, 1965, with Comparisons 1/

Type	Unit	1964/65 season		1963/64 Season				1962/63 Season					
		1/1/65	11/1/64	7/1/64	6/1/64	4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62
Distributors	1,000 actual cases	238	291	234	254	291	261	308	217	215	264	271	230
Canners	1,000 std. cases 2/	538	629	514	499	658	1,063	1,255	643	536	699	1,092	1,348

1/ Table represents marketing season from November 1-October 31.

2/ 100 $3\frac{3}{4}$ -oz. cans equal one standard case.

Note: Beginning with the Canned Food Report of April 1, 1963, U.S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old sample.

Source: U.S. Bureau of the Census, Canned Food Report, January 1, 1965.

The 1964 Maine sardine pack at the close of the season on December 1, 1964, totaled about 875,000 standard cases, according to the Maine Sardine Council. That was much less than the 1,585,000 cases packed during 1963, but more than the 679,000 cases packed during the regular season in 1961 when fishing was extremely poor.

According to the Maine Sardine Council, neither cannery, fishermen, nor scientists could offer any clear-cut explanation for the scarcity of fish during 1964. The consensus appears to be that it was probably a temporary combination of natural conditions that frequently occur in all populations of marine life. They see no evidence that the condition will continue to exist during the 1965 packing season which starts next spring.

Note: See Commercial Fisheries Review, Feb. 1965 p. 27.



Marketing

EDIBLE FISHERY PRODUCTS, 1964 AND OUTLOOK FOR 1965:

The 1964 United States catch of edible fish and shellfish dropped from the previous year. There were sharp declines in landings of Maine herring, shrimp, ocean perch, tuna, jack mackerel, halibut, whiting, cod, and scallops. Landings were heavier than in 1963 for only a few of the major species. Total supplies in 1964 were up, however, because larger frozen stocks were available as the year began and imports exceeded those of 1963. The rise in supplies of edible fishery products paralleled the rise in population, so per capita consumption in 1964 held about steady at 10.6 pounds. Retail prices for fishery products averaged a little lower in 1964 than the year earlier. But prices of several shellfish and some finfish items strengthened as supplies fell short of market needs toward the end of the year. Prices for shrimp, scal-



The so-called "Old Shed" area of New York City's Fulton Fish Market with East River Drive overpass in foreground.

lops, and spiny lobster tails advanced markedly during the year.

Fishery products supplies are expected to be lighter in early 1965 than in 1964. The supply of shellfish likely will be much below consumer needs. Frozen stocks of edible fish and shellfish held in cold-storage at the beginning of 1965 were down about 13 percent from a year earlier. The 1964 canned pack of fishery products was about the same as in 1963. Distributors are expected to draw heavily on cold-storage holdings and canned inventories until fishery landings increase seasonally starting in the spring.

On the average, prices may edge up and be slightly higher early in 1965 than they were a year earlier. United States imports of edible fish and shellfish will likely continue an upward trend. No change is foreseen in the per capita consumption rate of fishery products in 1965.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U.S. Department of the Interior, and published in the U.S. Department of Agriculture's February 1965 issue of the "National Food Situation" (NFS-111).



Maryland

STANDARDS FOR OUT-OF-STATE SHELLFISH ARRIVALS:

A Maryland law which became effective June 1, 1964, prohibits the importation into the State of all food products containing shellfish unless the shellfish is from sources which have been certified by the U. S. Public Health Service for interstate shipment. The law further states that all processors of food products containing imported shellfish must keep on file proof that the shellfish is from sources certified through the U. S. Public Health Service and shall forward to the Maryland State Department of Health such proof, if and when it is requested by the Department.

* * * * *

STUDY PROPOSED ON BOOSTING FISHERIES OUTPUT:

In February 1965, the Maryland State Government was asked to set up a commission to study ways of increasing Maryland's fisheries production, particularly in the Chesapeake Bay area. The commission would be asked to submit its findings to the Maryland State Legislature in 1966.

A State Senator supporting the proposed commission said, "We need recommendations on modern methods that can revitalize our seafood output, and it has to be done as quickly as possible. We are losing our oyster market to parts of Florida, Texas, and Louisiana, and even some of our seafood processing plants are closing. Not only must we be brought up to date on latest methods for increasing production, but also on ways to better protect the clean waters and seafood areas we now have."

The Senator said the commission membership should include Maryland watermen, as well as representatives of State agencies responsible for protecting Maryland waters. Other members should include marketing experts and economists, he added.

He pointed out that results of the study would fit into a long-range economic development program for southern Maryland formulated by State legislators from St. Marys, Charles, and Calvert Counties. (Washington Evening Star, February 7, 1965.)

* * * * *

NEW RESEARCH VESSEL FOR UNIVERSITY OF MARYLAND:

The 52-foot research vessel Orion was scheduled to sail in February 1965 from a boatyard in New Orleans, La., to the Chesapeake Biological Laboratory of the University of Maryland Natural Resources Institute. The Orion replaces the Cobia, which was retired in 1964. The steel-hulled, shallow-draft Orion is well suited to the choppy and sometimes ice-covered waters of Chesapeake Bay. Special gear on the vessel will enable University of Maryland scientists to trawl for fish and plankton specimens; gather oyster and crab samples; and make bottom and hydrographic surveys. Powered by two 300-horsepower diesel engines, the new vessel is expected to help scientists sample large areas of Chesapeake Bay under fast-changing tide, weather, and biological conditions.



North Atlantic

FOREIGN FISHING ACTIVITIES OFF COAST, FEBRUARY 1965:

In order to observe foreign fishing activities in the North Atlantic, the staff of the Fisheries Resource Management Office, U.S. Bureau of Commercial Fisheries, Gloucester, Mass., has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

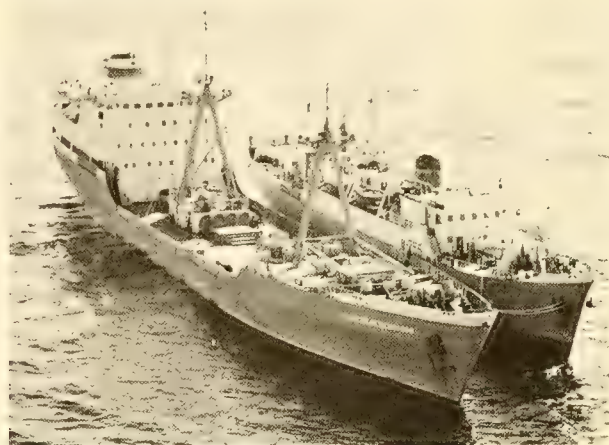


Fig. 1 - Aerial view of Soviet refrigerated fish transport Aleksei Venetsianov with factory stern trawler alongside. South Block Island (Block Canyon), January 1965.

Soviet fishing vessel activity in the North Atlantic increased substantially from January to February 1965. In February a total of

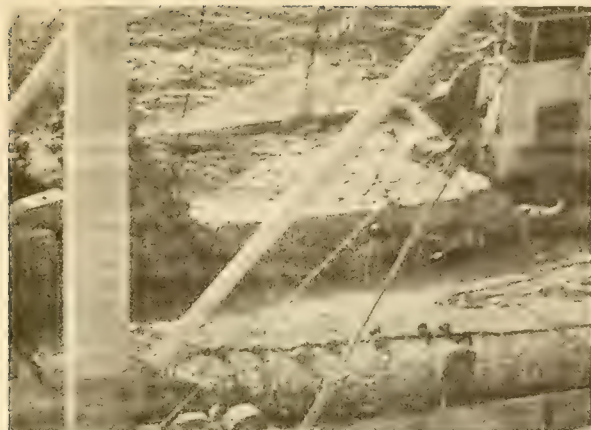


Fig. 2 - Aerial view. Cod end on deck of Soviet factory stern trawler with estimated catch of 40,000 pounds of whiting and red hake. Also note substantial amounts in open storage. South of Nantucket Lightship (Veatch Canyon), January 1965.

42 vessels were sighted and identified as 29 fish-factory stern trawlers, 7 refrigerated side trawlers (Pioneer class), 4 refrigerated and processing transports, 1 fuel and water tanker, and 1 tug. This compares with 26 vessels sighted during January, and with only 10 stern trawlers reported on Georges Bank at the same time a year earlier.



Fig. 3 - Aerial view. Large quantities of red hake awaiting to be processed on board Soviet factory stern trawler. South of Nantucket Lightship (Veatch Canyon), January 1965.

Soviet fishing operations during the month generally ranged from south of Montauk Point (Hudson Canyon) eastward along the 100-fathom curve of the Continental Shelf southeast of the Nantucket lightship (Hydrographer Canyon). Each vessel was actively engaged in fishing and had substantial quantities of fish on deck--predominately whiting and red hake.

Their dehydration plants were continually working, indicating that a portion of their catch was being used for fish meal.

The Soviet's apparent success in this present fishery is demonstrated by the increased number of stern trawlers, and more recently, the addition of large refrigerated side trawlers. The refrigerated side trawlers have never been known to fish areas that far south, and a guess is that their presence was caused by lagging fish production in other areas. The processing and refrigerated transport vessels observed during February were not previously seen and are believed to be new vessels put in operation within the past 12 months.

Fishing vessels operating out of New York City reported seeing Soviet vessels fishing in an area 70 to 80 miles southeast of Cape May, N. J. Indications were that 6 to 8 stern trawlers and several side trawlers were present in that area. Landings by the New York vessels during February were primarily scup. It was assumed the Soviets were also fishing for scup.

Note: See Commercial Fisheries Review, March 1965 p. 43.



North Atlantic Fisheries Explorations and Gear Development

OFF-BOTTOM TRAWLING EXPERIMENTS CONTINUED:

M/V "Delaware" Cruise 64-12 (November 30-December 11, 1964): To catch ocean perch (Sebastes marinus) found small distances above the rough bottom along the Nova Scotia coast from Liverpool east to Halifax was the objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware. The bottom in the area covered, in depths of 80 to 120 fathoms, is relatively rough although it is fished by commercial vessels on a limited scale during certain seasons.

The cruise was made as a continuation of studies initiated in September 1964 (M/V Delaware Cruise 64-8) for testing trawls rigged to fish at closely regulated heights above the bottom. If the slope was steep enough, the footrope of the net made contact with the peak (F) and stayed in contact until the doors again reached level bottom. This situation caused considerable damage to the lightly constructed net. Another factor con-

tributing to the net damage was the use of long ground cables and bridles necessary to allow the net to rise behind the doors. On several occasions the top wings and headrope sections of the net were damaged, suggesting that the long bridles and legs are subject to being snagged by obstructions, pulling the headrope down. Erratic height fluctuations of the net are also believed to be caused by this factor.

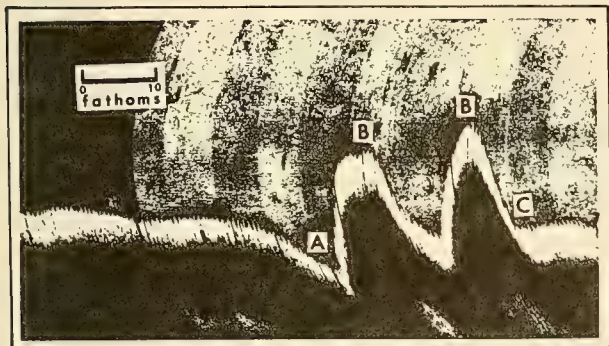


Fig. 1 - Shows bottom profile from vessel's transducer--Net behavior over rough bottom, M/V Delaware Cruise 64-12.

During the second phase of the cruise a roller rigged number 41 manila trawl attached to the doors by 5-fathom legs and 20-fathom ground cables was tested. The doors were the same as used in the first phase (4 ft. x 8 ft., 1,250 lbs.). The headrope was suspended by 8-inch aluminum floats and 6 floats were attached to the gore in the belly sections to keep the after portions clear of the bottom. Dropper chains, 3 fathoms long and weighing 55 pounds each, were fastened to the wing ends (as in the first phase) to help stabilize the fluctuations in elevation of the net. That net, so rigged, maintained a footrope height of about one-half fathom above the bottom when fished on smooth bottom. But on rough bottom the same problems experienced with the midwater trawl were encountered and the net was damaged frequently.

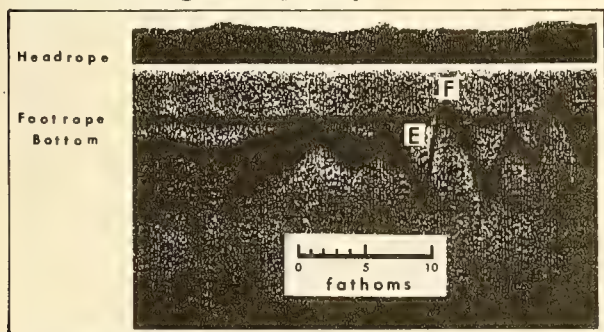


Fig. 2 - Shows footrope and bottom tracing from headrope transducer, M/V Delaware Cruise 64-12.

Only limited quantities of fish were located during the cruise; the best catch made during a 1-hour tow was 2,500 pounds of ocean perch. Although the nets can be rigged to maintain a constant height above smooth bottom and catch fish beyond the reach of nets now commonly used on the East Coast, the feasibility of using these methods to fish regularly untrawlable bottom is questionable in view of the damage sustained during these operations.

Note: See Commercial Fisheries Review, December 1964 p. 50.



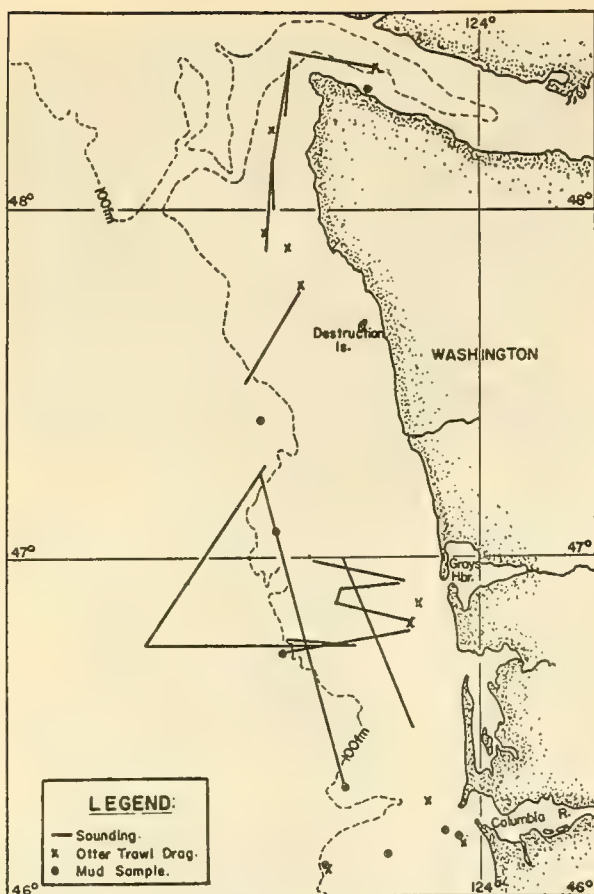
North Pacific Fisheries Explorations and Gear Development

DEMERSAL FISH OFF PACIFIC NORTHWEST COAST SURVEYED:

M/V "John N. Cobb" Cruise 69 (January 12-20, 1965): A nine-day cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb was completed January 20, 1965. This was the 16th survey cruise in the cooperative study of demersal fish off the Columbia River conducted by the Bureau and the U. S. Atomic Energy Commission. Objectives were to: (1) sample demersal fauna at 100 fathoms southwest of the Columbia River mouth for radiological analysis by the Laboratory of Radiation Biology at the University of Washington; (2) run echosounding transects along the Washington coast to detect any hake concentrations and to fish on "strong signs" with a bottom trawl when they occurred near bottom; (3) establish and monitor a series of standard stations off the northern Washington coast; and (4) collect samples of fish, shellfish, and mud for Clostridium botulinum analysis by the Bureau's Technological Laboratory at Seattle, Wash. Unusually good weather throughout the cruise permitted all objectives to be realized.

Since the majority of drags during the cruise were made between 20 and 50 fathoms, the catches were dominated by sand sole (Psetichthys melanostictus), English sole (Parophrys vetulus), sand dab (Citharichthys sordidus), Bellingham sole (Isopsetta isolepis), and skate (Raja binoculata). Five large white sturgeon (Acipenser transmontanus) were caught in 37 to 49 fathoms off the northern Washington coast.

Samples of Dover sole (Microstomus pacificus), rex sole (Glyptocephalus zachirus),



M/V John N. Cobb Cruise 69 (January 12-20, 1965).

sablefish (*Anoplopoma fimbria*), and 3 different species of rockfish (*Sebastes elengatus*, *flavidus*, and *pinniger*) were collected and frozen for the Laboratory of Radiation Biology. Additional samples of rex sole plus petrale sole (*Eopsetta jordani*) and Dungeness crab (*Cancer magister*) were earmarked for botulism studies.

With a six-foot gravity corer and/or a Dietz-LaFond bottom sampler, 11 substrate samples were obtained at depths from 18 to 660 fathoms. Those samples were to be cultured by the Bureau's Seattle Technological Laboratory to determine the presence or absence of *Clostridium botulinum*.

Hake reconnaissance, using a high-resolution low-frequency echo-sounder, was conducted along 16 transects which varied in length from 2½ to 57 miles. Major emphasis was given to the area off Willapa Bay and Grays Harbor with one transect extending 55 miles off the coast. With the exception of a

few isolated schools of what appeared to be anchovies, and a slight "show" at depths between 25 and 35 fathoms below the surface in 1,060 fathoms of water (55 miles west of Grays Harbor), no recognizable midwater concentrations of fish were encountered.

The John N. Cobb was scheduled to leave Seattle on February 1 for a six-week exploratory hake fishing survey (Cruise No. 70) of Pacific Coast waters from Puget Sound to northern Mexico. In southern California waters, hake explorations will be coordinated with the Bureau's research vessel Black Douglas, and with personnel of the Bureau's Biological Laboratory, La Jolla, Calif.

The area of operations during this cruise will be in northern Puget Sound, off the coasts of Washington, Oregon, California, and northern Mexico.

The primary purpose of Cruise 70 will be to determine the availability of hake (*Merluccius productus*) in Pacific Coast waters during late winter and early spring months which corresponds to the hake's spawning period. Core samples of the substrate will be taken south of the Columbia River for the Bureau's Seattle Technological Laboratory for use in studies on *Clostridium botulinum*.

Note: See Commercial Fisheries Review, November 1964 p. 46.

North Pacific Fishery Investigations

WINTER DISTRIBUTION OF SALMON IN NORTHWESTERN PACIFIC STUDIED:

The research vessel George B. Kelez, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Seattle, Wash., was scheduled to begin, on or about February 1, 1965, a two-month salmon research cruise in the northwestern Pacific Ocean. The primary objective of the winter cruise was to determine the distribution and abundance centers of salmon in the western



Research vessel George B. Kelez of the U.S. Bureau of Commercial Fisheries.

Aleutians, in areas previously fished during the months of September and October.

During the summer, the majority of immature salmon in the Aleutian area move westward along the south side of the island chain and in September-October have been found in concentrations between Attu and the Kammandorsky Islands. Using surface gill nets as the primary sampling gear, the vessel was to attempt to determine whether the fish remain to the west in winter, move into the Bering Sea, or travel south and east back to the central North Pacific. For fish concentrations, long lines were to be used to capture live salmon for tagging so as to determine the area of origin of those fish. Salmon samples were to be brought back to the Bureau's laboratory for use on investigations of racial origin, age, growth, and other biological studies. This salmon research cruise was scheduled for completion by the end of March 1965.

Note: See Commercial Fisheries Review, July 1964 p. 30.



Oceanography

BASIC LINK IN MARINE FOOD CHAIN DISCOVERED:

Three United States scientists have recently discovered what they believe to be a vast unsuspected food supply for marine life.

This previously unknown link in the marine food chain, they believe, consists of non-living organic particles constantly being caught on air bubbles in the sea. These bits of brown matter are eaten by the tiniest sea animals, called zooplankton, which in turn are the basic food supply for higher marine life.

For the past 100 years, scientists believed that the tiny sea animals ate only tiny sea plants, and that these plants absorbed the inorganic matter that came from decomposed fish and other sea creatures. In other words, they believed that the cycle of life was fed only by life or remains of life.

Now, scientists understand that the zooplankton eat accumulated particles of organic nonliving material.

This explains the former mystery of how the tiny sea animals could live during the winter months when the food supply furnished

by tiny plants (photoplankton) was depleted and how they could live in the deep dark water beyond the depth of the tiny plants which need sunlight for their life processes.

Long aware of large quantities of both dissolved and clumped organic matter in the oceans, scientists have estimated the total nonliving organic content of sea water to be at least 50 times larger than the living portion.

Joint discoveries of this vast source of food in the sea were made by a scientist at Yale University and two scientists at the Woods Hole (Mass.) Oceanographic Institution. Their research was conducted under grants from the National Science Foundation.

"We don't exactly yet know what these brown particles are," one of the scientists said. "But we do know they are mixtures of such things as fatty acids, proteins, carbohydrates, and polypeptides." These organic particles, all essential parts of the building blocks of life, are formed when dissolved organic matter in the sea sticks onto air bubbles. The scientists discovered this process in the laboratory and found that continued bubbling resulted in the buildup of larger clumps of particles.

One of the scientists said that, in the ocean, the process works something like this: As waves break across the ocean and form white caps, they drop foaming water twice as deep into the sea as the wave is high. Churning air bubbles provide a surface upon which the dissolved substances of the sea adhere to form larger particles.

As the air bubbles rise to the surface of the ocean, the wind blows the foam into long lines or windrows of spume and brings the particles together in a film which might be a molecule thick. This film is pushed around by the wind and the waves and becomes wrinkled, piled up, and folded over to form aggregates of particles which are large enough for tiny sea animals to eat.

Some of these particles begin to sink slowly through the ocean, and as they drop, more dissolved matter adheres to them. All this forms part of the "marine snow" which has been often reported but never until now understood. The Yale University scientist who took part in the original discovery is continuing his studies of organic particulate

matter with emphasis on deep-sea studies. Many of the processes involved in the formation of organic aggregates and their relation to the marine community as a whole are not yet well understood. Further research should better illuminate these processes and their significance.

A further sidelight of research into the nature of organic particulate matter and its formation in the sea is a theory proposed by another marine biologist at Yale University. By bubbling a mixture of artificial sea water containing inorganic and organic compounds in solution, he found that the organic compounds could be concentrated on bubbles. Further bubbling may cause these compounds to form more complex organic molecules, he said.

He believes that this mechanism of adsorption by bubbling may have been an important step in the long process of evolution from inorganic chemicals to life in the sea. "Even if life did not trace its ancestry back to air bubbles in the sea," he said, "it seems certain that if a stable marine food supply created from a vast reservoir of dissolved organic matter did not exist, there would be less life today and fewer stable forms. Probably most deep-sea life would be nonexistent since organic particulate matter appears to be their basic food source." (National Science Foundation, October 5, 1964, and Science News Letter, October 17, 1964.)

* * * * *

COAST AND GEODETIC SURVEY VESSELS CHART AND SURVEY THE OCEAN:

Fifteen vessels of the U. S. Coast and Geodetic Survey will travel more than 130,000 miles in the Atlantic, Pacific, and Gulf of Mexico during the 1965 marine survey season extending from February to October. The vessels range in size from the 66-foot Wainwright and Hilgard to the 303-foot Oceanographer.

The Hydrographer, Bowie, and smaller vessels like the Marmer will nose their way up and down such bodies of water as Long Island Sound, the Straits of Florida, and Puget Sound. The two small wire-drag vessels, the Wainwright and Hilgard, which work together, will probe the waters off Florida and the Gulf Coast for undersea hazards to navigation, such as sunken wrecks and jutting rocks. The larger ocean survey vessels, such as the Pio-



Fig. 1 - The Pathfinder, one of the larger ocean survey vessels.

neer, Pathfinder, Surveyor, and Oceanographer, will work the deep ocean.

Other vessels in the fleet include the Explorer, Hodgson, Lester Jones, Patton, Peirce, and Whiting. The vessels depart from Seattle, Wash.; Oakland, Calif.; St. Petersburg, Fla.; Savannah, Ga.; and Norfolk, Va.

Twelve of the vessels have the exacting task of revising or updating coastal chart information. In order to find the safest routes for mariners, the vessels will determine changes in charted land features and the shoreline, shifting of sand bars and shoals, and changes in depth and currents in navigable channels.

On a broader scale, the remaining vessels will explore offshore waters and collect systematic oceanographic data. From such information, scientists hope to develop basic maps of the topography of the ocean floor; the gravitational and magnetic fields; the temperature, salinity, and chemical properties of the water; the movement of ocean currents; and the ocean's surface conditions and weather. Such information is necessary for the further development of the ocean's resources.

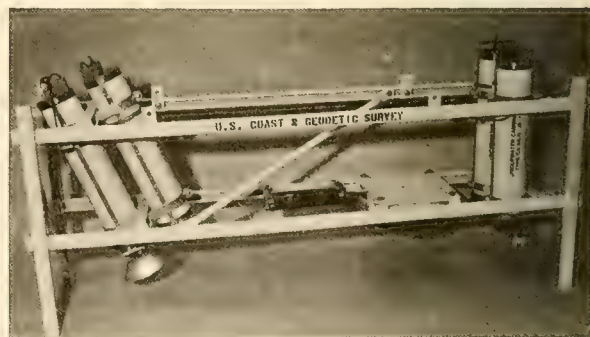


Fig 2 - "Stereo" deep-sea camera used by U.S. Coast and Geodetic Survey to photograph in color sea life at 2,000 feet and bottom formations at more than 7,000 feet.

The Coast and Geodetic Survey is the Government's chief civilian oceanographic agency. It also oversees the operation of a worldwide network of seismographs which, when completed, will include 125 stations in 63 countries and may some day provide the basis for an advance earthquake warning system. It operates the Pacific Seismic Sea Wave Warning System, a network of some 60 tide stations which alerts people along the Pacific when destructive seismic waves may strike. The agency also provides geodetic, geophysical, photogrammetric, and cartographic data for charting and scientific purposes and for defense needs. It produces and distributes approximately 30 million aeronautical and nautical charts each year and does extensive work in research and development. (U.S. Coast and Geodetic Survey, February 21, 1965.)

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MIAMI CONFERENCE ON RESEARCH VESSELS:

A conference on research vessels and their operation was held February 9-11, 1965, at the Institute of Marine Science, University of Miami. It was attended by representatives of leading oceanographic institutions.

During the meetings, oceanographers and ship operators discussed such matters as the development of new designs for research vessels, pending legislation in Congress involving the operation of research vessels, and problems of labor and recruitment. An engineering symposium was also held.

Institutions represented at the conference included the Woods Hole Oceanographic Institution, Scripps Institution of Oceanography, Lamont Geological Observatory of Columbia University, University of Oregon, University of Washington, University of Hawaii, Duke University, Hopkins Marine Station of Stanford University, University of Alaska, University of Rhode Island, Texas A & M University, University of Michigan, Chesapeake Bay Institute of Johns Hopkins University, and the University of Miami. Representatives were also present from U. S. Office of Naval Research and the Navy's Bureau of Ships. (University of Miami, February 12, 1965.)

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NEW STUDY ON SURFACE CURRENTS OFF ATLANTIC COAST:

A new study of surface currents in the waters off the Atlantic coasts of the United States and Canada will help shed more light on such problems as the disposal of atomic waste materials, shore pollution, and the migration of fish, according to the American Geographical Society.

In a series of minutely detailed charts, the study describes and maps the paths presumably taken by thousands of "drift bottles" dropped into the offshore waters over the Continental Shelf and allowed to float ashore. More than 156,000 drift bottles have been released by various American and Canadian research groups during the 14 years between 1948 and 1962. They were dropped from research vessels, ferries, aircraft, and "Texas Towers," along the coasts from Newfoundland to Florida. Ten percent of the bottles released were found on the North American seaboard, although many more might have drifted ashore without being discovered. Two percent of the total, swept along by the Gulf Stream and its branches, were found overseas.

Each of the drift bottles contained a self-addressed return postcard asking the finder to note on it the date and location in return for a small reward. The Woods Hole Oceanographic Institution, which has maintained a log of all bottles released and recovered by its own as well as by cooperating investigators, coordinated the drift-bottle data.

The study is said to be the most comprehensive of its kind ever made and is the work of two oceanographers--one a Senior Scientist at the Woods Hole Oceanographic Institution and the other a scientist of the Fisheries Research Board of Canada. Published as Folio 7 of the American Geographical Society's "Serial Atlas of the Marine Environment," the study includes 12 charts, one for each month of the year. The charts show where drift bottles were released, the percentage washed ashore and recovered, and the direction and speed in miles per day, of the surface drift. Four other maps show the circulation pattern by seasons.

The American Geographical Society, New York, N. Y., began publication of the Serial Atlas in 1962, specifically as a research tool by means of which important oceanographic data could be made generally available.

Another purpose was to speed interdisciplinary communication. Each folio of the Atlas studies some aspect of the marine environment--biological, geological, physical, or chemical. Maps are printed on translucent paper, in both bound- and loose-leaf editions. The loose-leaf form permits any one of the separate map plates to be placed on a light-table in register with plates on the same scale in other folios so that comparative studies can be made more easily.



Oregon

LARGE-SCALE SALMON PLANTING IN THE WILLAMETTE RIVER:

A big effort is under way to set up a fall chinook salmon run in the Willamette River in Oregon. Plans call for Federal and State hatcheries to release about 11 million young fall chinook salmon in the Willamette during early 1965.

A key factor in the project is the proposed modern fishway at Willamette Falls. The Willamette River apparently has never had many fall chinook salmon because their upstream migration occurs when low water makes Willamette Falls all but impassable. The old fish ladder there has been of little value. The proposed new ladder would let adult salmon get over the falls at all but extremely high river flows. Subject to the availability of Federal funds, the new fishway is tentatively scheduled for completion in the summer of 1966.

The planting of fall chinook salmon in the Willamette is being carried out under the Columbia River Fishery Development Program of the U. S. Fish and Wildlife Service in cooperation with State fish and game agencies of Oregon and Washington.

The Washington State hatchery at Skamania is rearing and will release 2.5 million young chinook in the Willamette system. The Oregon State hatchery on Gnat Creek is rearing and will release about 1 million. Eagle Creek National Fish Hatchery in Oregon will put 1.5 million young chinook into the Willamette's tributaries and Spring Creek National Fish Hatchery in Washington will contribute 2 million.

In addition, the Oregon Fish Commission will release about 4 million young fall chinook fingerlings above Willamette Falls. Those fingerlings are surplus stock from hatcheries which were filled to capacity by the millions of eggs taken from the Columbia River salmon run in 1964.

The Willamette River system offers a great untapped area in the Columbia Basin for the development of a fall chinook salmon run.



Oysters

NEW METHOD OF PREPARING FOR SHUCKING:

A firm in New Orleans, La., has developed a new method of preparing oysters for shucking. The new method causes the oysters to gape, allowing easy removal from the shell. It also results in a thorough cleaning of the shellstock, a factor which has impressed health officials who have observed the operation.



Rhode Island

ONE-DAY FISHERMEN'S FORUM HELD:

The University of Rhode Island held a one-day Fishermen's Forum on its campus on March 6, 1965, to provide working fishermen with information on new types of trawls, electronic fish-finding equipment, refrigerated sea-water storage, and experimental government fishing efforts.

Sponsored by the Marine Resources Program of the University of Rhode Island in cooperation with the Pt. Judith (R. I.) Fishermen's Cooperative, the activities were planned by the University's faculty members with the help of a five-member committee of fishing vessel captains and crew members. "They actually told us what topics they were interested in having tackled at that Forum. Most of the agenda is an outcome of meetings and discussions with them," an associate professor of food and resource economics explained. In addition to a series of speakers, the agenda included films, slides, and question-and-answer periods.

The fourth in a series that began in 1961, the Forum was open to the public. A staff member of the Vessel and Gear Section, Industrial Development Service, Canadian Department of Fisheries, discussed the "New-foundland Trawl." The assistant chief of the Branch of Exploratory Fishing, U. S. Bureau of Commercial Fisheries showed a film about the "Midwater Trawl," which was used successfully at varying depths off the bottom in European waters and experimentally on the United States west coast. (Species such as hake, whiting, and butterfish--frequently found in midwater depths--may not be caught by fishermen relying on the otter trawl which is dragged along the bottom.) The director of the Bureau's Technological Laboratory, Gloucester, Mass., discussed the technical aspects of "Refrigerated Sea Water Storage" aboard fishing vessels. (This method of preserving fish--as opposed to ice--holds promise of cutting down on fish damage and of increasing the ease of handling and unloading.)

The morning and afternoon sessions concluded with one-hour discussion periods. The speakers rotated through each conference room to answer questions. The afternoon program had as its theme: "New Developments in Fish-Finding Equipment." An electronic technician from the Bureau's Biological Laboratory, Woods Hole, Mass., outlined general developments in the last few years in the electronics field. The captain of the Bureau's research vessel Albatross IV, which is based at Woods Hole, illustrated his talk on "The Experience with Albatross IV as Seen from the Fisherman's Point of View," with a film. (Press Release of University of Rhode Island.)



Salmon

U. S. PACIFIC COAST CANNED STOCKS, FEBRUARY 1, 1965:

On February 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 2,477,961 standard cases (48 1-lb. cans), 371,893 cases less than on January 1, 1965, when the pack was 290,200 cases less than on December 1, 1964.

On the basis of a total of 2,936,600 actual cases (consisting of cans of $\frac{1}{4}$ -lb., $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon make up 52.8 percent (1,550,541 cases, mostly 1-lb. talls) of the to-



Cases of canned salmon on pallets are transported from Alaska vessel into Seattle warehouse on forklift trucks. Palletization is speeding up the transportation of canned salmon.

tal canners' stocks on February 1, 1965. Next came chum (648,041 cases, mostly 1-lb. talls), followed by red (511,299 cases). The remainder of about 7.7 percent was coho (silver) and king salmon. About 80 percent of the pink salmon stocks on hand was packed in 48 1-lb. cans, and the balance mostly in 48 $\frac{1}{2}$ -lb. cans.

Table 1 - Total Canners' Stocks of Pacific Salmon, February 1, 1965, with Comparisons

Species	Feb. 1, 1965	Jan. 1, 1965	Dec. 1, 1964
	(No. of Actual Cases)		
King	79,834	91,675	94,648
Red	511,299	607,913	674,711
Coho	146,885	176,504	222,095
Pink	1,550,541	1,795,619	1,977,112
Chum	648,041	726,063	782,844
Total	2,936,600	3,397,774	3,751,410

From January 1 to February 1, 1965, pink salmon stocks were lower by 245,078 actual cases (1-lb. talls lower by 189,519 cases), reds were down 96,614 cases, and chums were down 78,022 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new sea-

Table 2 - Total Cannery Stocks on Hand February 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb.	7,453	89,748	44,585	5,155	1,150	148,091
48 $\frac{1}{2}$ -lb.	65,590	256,487	24,803	266,361	81,900	695,141
48 1-lb.	6,689	164,917	68,483	1,251,034	546,190	2,037,313
12 4-lb.	102	147	9,014	27,991	18,801	56,055
Total	79,834	511,299	146,885	1,550,541	648,041	2,936,600

Table 3 - Cannery Shipments from July 1, 1964, to February 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb.	16,794	338,184	78,107	6,526	294	439,905
48 $\frac{1}{2}$ -lb.	71,252	430,607	29,572	337,107	76,191	944,729
48 1-lb.	15,432	333,137	100,026	1,146,890	332,417	1,927,902
12 4-lb.	314	4,803	12,476	71,406	20,741	109,740
Total	103,792	1,106,731	220,181	1,561,929	429,643	3,422,276

son pack of 3,922,356 standard cases brought the total available supply for the 1964/54 season to 5,097,944 standard cases.

Shipments at the cannery level from July 1, 1964, to February 1, 1965, totaled 3,422,276 actual cases (equal to 2,619,983 standard cases). Shipments during January 1965 totaled 371,893 standard cases of which 189,519 cases were pink salmon in 1-lb. talls.

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 97 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, February 25, 1965.)



Shark

TAGGING PROJECT IN EASTERN PACIFIC RELATED TO SHARK CONTROL WORK:

In late 1964, some 560 sharks were tagged along the Pacific coast of Mexico by biologists of the U. S. Bureau of Commercial Fisheries Tuna Resources Laboratory, La Jolla, Calif. Concern over shark damage to tuna purse-seine nets is the main reason for the Bureau's interest in shark. The tagging was done to learn more about their growth and migration. Such knowledge can aid efforts to control the "net-eating" shark which plague tuna fishermen.

The shark-tagging work off Mexico was done from the chartered vessel Red Rooster during a 60-day cruise which ended December 30, 1964. During cruise, 35 tagged shark

were recaptured including 3 previously tagged in June 1964 and 1 tagged in August 1962. The cruise was sponsored by the Shark Research Panel of the American Institute of Biological Sciences and the U. S. Office of Naval Research, who also want to learn more about the life history of sharks, of which so little is known. Including previous tagging conducted from the purse-seine vessels Royal Pacific and West Point in 1962, a total of about 1,000 tagged shark have been released in the eastern tropical Pacific. The areas of tagging are shown in figure 1 (see page 35).

It is essential that more of the tagged shark be recaptured in order to gain information about their movements. Fishermen can greatly aid this work by reporting all tagged shark recaptured in the Pacific.

Four different types of tags, pictured in figure 2, have been used. Recovered tags, along with information on date and place of capture, should be forwarded to the U. S. Bureau of Commercial Fisheries, La Jolla, Calif., or turned over to representatives of any fishery research agency in San Pedro

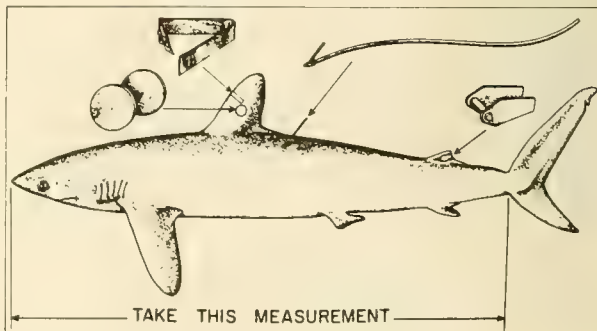


Fig. 2 - Types of shark tags. Tags are, left to right: Petersen disc, cattle, dart, and sheep.



Fig. 1 - Tagging areas. Shaded areas show where tagged sharks have been released.

or San Diego, Calif. A nominal reward of \$1 will be paid to those returning tags. It would be helpful, additionally, if the tagged shark were measured (from tip of snout to base of tail), or if the entire shark were frozen and brought to port for pick-up by the Bureau of Commercial Fisheries.

Ways of controlling shark attacks on fishing nets are being sought. Chemical "repellents" have not proved to be effective. Another approach to shark control is to reduce their number. The histories of the now-defunct soupfin shark fishery in California and the present shark fishery in Australia have shown that populations of shark can be reduced significantly in a surprisingly short period of time. In fact, both California and Australia had to resort to protective meas-

ures in order to maintain their shark fisheries. In Hawaii, a year-long shark eradication program conducted in 1959-1960 resulted in a fast decline of coastal shark. Just how quickly shark populations can be reduced in particular areas by fishing depends on how widespread their movements are. Learning more about such movements is a major objective of the present shark-tagging program.

The Mexican shark fishery has recently undergone rapid growth. Shark fishing centers are now located from Guaymas to Salina Cruz. The fishery is coastal, and for the most part depends on shark that are not associated with tuna schools. However, the increasing growth of the fishery will probably lead to an expansion of the fishery to include shark in offshore waters. The fishery at Las

Tres Marias, for example, has expanded from coastal gill-netting to high-seas long-lining. The most abundant shark in that fishery is the "net-eater" which is responsible for most of the attacks on purse seines. The continuing expansion of the Mexican shark fishery may prove to be beneficial to U. S. tuna fishermen.

In Mexico, shark meat is eaten fresh or as "bacalao" (salted and dried fillet). The liver and waste products are also used, the latter for fertilizer. Hides are exported to the United States where high-grade leather is made from them. Fins are shipped to the Orient. In the United States, the market for shark meat is restricted to only a few species. However, the Bureau of Commercial Fisheries has received inquiries requesting names of suppliers of dried shark fins for export to Hong Kong. The price offered is about \$1 a pound for dried fins of acceptable quality. One buyer reportedly can handle 10,000 to 20,000 pounds of shark fins per month. Interested fishermen are invited to contact the Director, Tuna Resources Laboratory, U. S. Bureau of Commercial Fisheries, P. O. Box 271, La Jolla, Calif., for further information.

Note: See *Commercial Fisheries Review*, Aug. 1964 p. 78, July 1964 p. 61, Dec. 1962 p. 50.



Shellfish

7TH ANNUAL SHELLFISH MORTALITY CONFERENCE HELD:

The 7th Annual Shellfish Mortality Conference, sponsored by the Virginia Institute of Marine Science, was held at Gloucester Point, Va., January 25-26, 1965. About 50 scientists from Atlantic and Gulf Coastal States and from Canada attended the Conference to discuss problems relating to shellfish mortalities and to report progress made. The subjects presented ranged from the composition of oyster blood through the various forms of MSX to the progress made in breeding oysters resistant to disease.

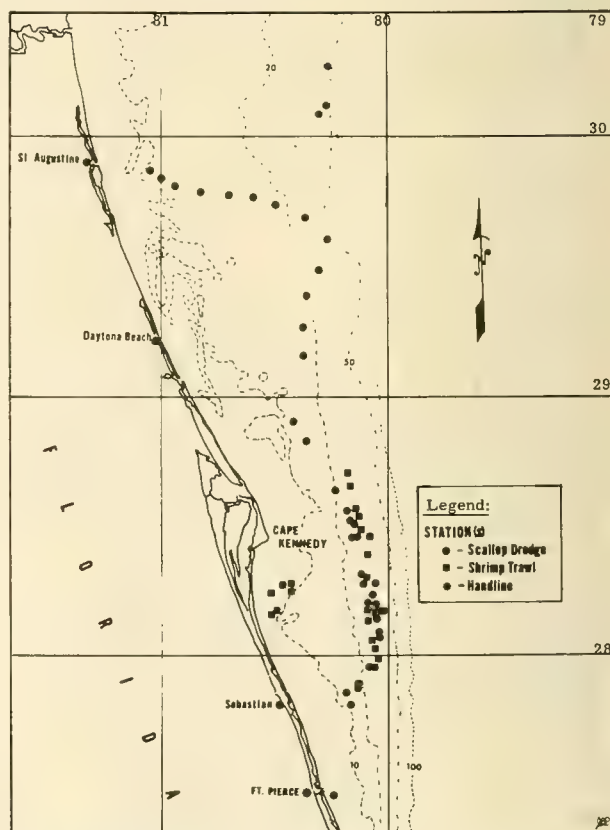
Research done at universities and state and Federal-conducted laboratories will eventually result in growing oysters and other bivalves scientifically. This will lead to less dependence on wild oysters and their fluctuations in abundance, which is a major problem of shellfish producers. (Virginia Institute of Marine Science, Gloucester Point, Va.)



South Atlantic Fisheries Explorations and Gear Development

CALICO SCALLOP PROCESSING EQUIPMENT TESTED ABOARD VESSEL AT SEA:

M/V "Oregon" Cruise 97 (January 11-22, 1965): Cooperative Bureau-industry tests of recently developed calico scallop (*Pecten gibbus*) processing machinery were undertaken aboard the Bureau of Commercial Fisheries exploratory fishing vessel *Oregon* during recent shellfish explorations in order to evaluate the feasibility of processing this species at sea. During the cruise, the vessel operated off the Florida east coast on scallop grounds located during earlier Bureau work. The more important aspects of the tests centered around modifications to and the operation of scallop-eviscerating equipment employing a completely new principle. Observations showed that the eviscerator functioned well, and the developers of the equipment indicate they hope to have it ready for commercial application in the near future.



Area investigated off Florida's east coast during Cruise 97 of the M/V *Oregon* (January 11-22, 1965).

Forty-six 30-minute drags with 6- and 8-foot tumbler dredges yielded catches of calico scallops ranging from 0 to 20 bushels per drag. Most were medium scallops (45-50 millimeters or 1.8 to 2.0 inches in width) which yielded 112 to 142 meats per pint (one pound). Commercial concentrations of scallops were located in 28 fathoms off Cape Kennedy.

Large brown shrimp (*Penaeus aztecus*) were located off the Florida east coast in a depth of 30 to 32 fathoms. Although trawling was limited to 24 drags, bottom conditions suitable for shrimp trawling were found in depths ranging from 26 to 43 fathoms between Bethel Shoal and Cape Kennedy (27° 57' to 28° 42' north latitude). Shrimp catches ranged from 0 to 25 pounds (heads-on) of 16-20 count brown shrimp per hour with a 40-foot flat trawl fished on 6-foot chain doors. Fish catches in the area ranged from 30 to 832 pounds per drag, mostly croaker (*Micropogon undulatus*), spot (*Leiostomus xanthurus*), pinfish (*Lagodon rhomboides*), filefish (*Stephanolepis hispidus*), and kingfish (*Menticirrhus* sp.).

Hand lines, fished at three stations, yielded catches of mixed bottom and near-bottom fish species. Specimens collected from trawls, dredges, and nekton and plankton nets were preserved for cooperative studies with other U. S. Bureau of Commercial Fisheries laboratories.

Note: See Commercial Fisheries Review, June 1964 p. 27.



States Legislation

ACTIONS AFFECTING FISHERIES:

Following is a list of proposed State Legislative actions affecting fisheries. The bills listed are those introduced during the current session of the various State Legislatures. (Information Letter, National Canners Association, February 20, 1965.)

Alaska: H. 76 would create a division of seafood research within the Alaska Department of Economic Development.

H. 109 relates to the payment of debts incurred by fish and marine products buyers.

S. 19 would require the processor or fish buyer to furnish information concerning per-

sons from whom he purchased fish; would be retroactive to January 1, 1965.

S. 1 would require that a primary buyer "shall purchase raw fish by the pound."

S. 33 specifies that in arriving at a wholesale price relative to fisheries taxes, the discount allowed for cash would be increased from 1½ to 2 percent.

S. 34 would levy an annual license tax on crab bought or obtained for processing by any method, of 2 percent of the value of the raw crab.

Oregon: S. 235 relates to the control of commercial fishing. It would provide for the licensing and bonding of commercial fishing and canning operations.

Maine: H. 94 relates to a license for sardine packers.

H. 95 would repeal the law regulating the canning of herring.

S. 293 would repeal the Fish Packing Wage Board law.

H. 898 relates to the merchandising of Maine sardines.

H. 848 relates to the repeal of the sardine tax on exports.

Massachusetts: H. 2170 would provide for a study to determine the need for licensing the importation of certain lobsters.

H. 1006 relates to the importation of shellfish for consumption as food.

H. 249 relates to a study of certain marine matters and the financing of a fisheries fund through certain industries such as processing plants.

H. 391 relates to the sale of certain cooked lobsters.

H. 410 would authorize the Massachusetts Department of Public Health to make rules and regulations for the packaging of food.

H. 30 would further regulate the identity and quantity of commodities in packaged form.

H. 3048 would further define the laws relative to the licensing of dealers in fish and shellfish.

H. 3207 would regulate the unloading of fish for human consumption.

H. 253 relates to permits and certificates issued by the Massachusetts Division of Marine Fisheries.

H. 1402 would provide for annual examinations of certain persons engaged in the business of handling food.

S. 444 would remove restrictions on the sale of scallops not in the shell or of soaked scallops.

S. 447 would further regulate the sale, transportation, and possession of lobster meat.

S. 448 pertains to the legal length of lobsters.

S. 111 would establish a wholesale market authority.

S. 450 relates to the development of the commercial fishing industry.

New York: A 1243 relates to labeling. The bill says that no manufacturer, processor, canner, bottler, packer, wholesaler, retailer, or other distributor shall sell or offer sale for consumption in the state, any container having canned, bottled, dehydrated, frozen, or processed food articles unless the containers are labeled indicating the grade or quality of articles and certain other information.

Maryland: H. 32 would require the licensing of oyster buyers and certain oyster bay boats, vessels, and vehicles.

Arkansas: S. 32 would require all fresh, chilled, packaged, processed, or frozen meats which are produced in foreign countries and imported into this country to be labeled as foreign goods with the exception of seafoods.

Minnesota: H. 602 would permit regulations including standards of net weight, measure, or count and prohibit packages made, formed, or filled so as to deliberately and intentionally deceive the purchaser as to the quantity of contents of the package.



United States Fisheries

VALUE OF COMMERCIAL FISHERY LANDINGS HIGHER IN 1964:

United States landings of fish and shellfish dropped sharply in 1964, but because of higher prices for several species and increased landings of some higher-priced species, commercial fishermen received slightly more than in 1963.



Fig. 1 - Unloading frozen tuna from a California purse-seiner.

Preliminary data show that the 1964 landings of 4.4 billion pounds were about 9 percent below landings of a year earlier, or down about 447 million pounds.

During the past 5 years, United States fishermen have received about \$367 million annually for their catch. Imported fishery products during the same period had an average annual value of some \$420 million. Consumers spend about \$2 billion annually for fishery products, 60 percent of that amount being spent for fishery products of domestic origin.

For the second consecutive year, the United States imported more than 60 percent of the fishery products used. Major imports were fish meal, tuna, frozen fillets, shrimp, sardines, and lobsters.

The 1964 landings of industrial fish, principally menhaden, accounted for about 336 million pounds of the decrease, with heaviest losses in menhaden occurring in the Middle Atlantic fishery. The total 1964 catch of food fish was down about 100 million pounds, according to preliminary data.

The most important increase in the 1964 landings was in the estimated salmon catch



Fig. 2 - Gill-net boat in Alaska with a load of red salmon.

in Alaska of about 312 million pounds--an increase of 89 million pounds, or 40 percent more than in 1963. The Alaska catch was up for all salmon species, with red, pink, and chum salmon accounting for most of the gain. But the salmon catch in the State of Washington was down nearly 34 million pounds--mostly pink salmon. The decrease is not considered unusual because few pink salmon enter Puget Sound waters in even-numbered years. Pink salmon there have a 2-year reproduction cycle, and so far all attempts to change that cycle have failed. There also was a drop of several million pounds in the red salmon catch in Puget Sound waters.

Landings of other species which increased in 1964 included Alaskan king crab and Alaskan herring, as well as haddock from the New England fishery. The Maine herring fishery had the largest decline in the United States food fish catch. Only 61 million pounds were caught in 1964--a drop of 93 million pounds or 60 percent lower compared with 1963. Shrimp landings along the South Atlantic and Gulf States in 1964 were down about 26 million pounds or 11 percent below the 1963 landings.

The United States continued to rank fifth among leading fishing countries of the world--trailing Peru, Japan, Communist China, and the Soviet Union in that order. Peru replaced Japan as world leader in total fishery landings in 1962 with a spectacular increase in the catch of industrial fish (anchoveta) used primarily for fish meal. Peru's total fishery landings in 1964 were more than 200

United States Commercial Fishery Landings of Principal Species, 1964 and 1963		
Species	1/1964	1963
	.. (1,000 Lbs.) ..	
Fish:		
cod	41,800	48,546
flounders	173,200	176,798
haddock	133,200	123,972
hake, white	6,700	6,249
halibut	35,300	45,841
herring, sea:		
Atlantic	61,400	154,770
Pacific	53,900	38,834
mackerel, Calif.:		
jack	88,900	95,442
Pacific	24,900	40,243
menhaden	1,480,000	1,815,798
ocean perch, Atl.	88,000	108,292
pollock	13,700	14,607
salmon	350,300	294,177
sardine, Pacific	10,500	7,131
tuna:		
albacore	41,100	60,802
bluefin	30,300	41,313
little	60	72
skipjack	77,100	108,997
yellowfin	149,900	110,424
unclassified	-	11
Total tuna	298,460	321,619
Shellfish:		
clams	66,000	63,669
crabs	256,600	252,334
lobster, northern	29,800	30,274
oysters	58,100	58,444
scallops, sea	16,600	19,939
shrimp	214,600	240,473
Total all above items	3,501,960	3,957,452
Other	898,040	889,923
Grand total	4,400,000	4,847,375
1/Preliminary.		

times what they were in 1947, and more than 47 times the landings of 10 years ago.

Note: See Commercial Fisheries Review, February 1965 p. 41; May 1964 p. 34.



U. S. Fishing Vessels

DOCUMENTATIONS ISSUED AND CANCELLED:

October 1964: During October 1964, a total of 36 vessels of 5 net tons and over was issued first documents as fishing craft, the same as in October 1963. There were 39 documents cancelled for fishing vessels in October 1964, as compared with 28 in October 1963.

Table 1 - U. S. Fishing Vessels 1--Documents Issued and Cancelled, by Areas, October 1964 with Comparisons

Area (Home Port)	October		Jan.-Oct.		Total
	1964	1963	1964	1963	
	(Number)				
<u>Issued first documents 2/:</u>					
New England	3	2	29	20	23
Middle Atlantic	1	-	9	16	18
Chesapeake	9	9	36	54	66
South Atlantic	3	6	39	65	77
Gulf	11	15	194	209	239
Pacific	7	4	130	150	160
Great Lakes	1	-	2	4	5
Hawaii	-	-	1	-	-
Puerto Rico	1	-	2	2	2
Total	36	36	442	520	590
<u>Removed from documentation 3/:</u>					
New England	7	3	36	41	48
Middle Atlantic	5	-	19	42	47
Chesapeake	4	3	19	19	25
South Atlantic	12	2	39	47	53
Gulf	6	13	62	100	118
Pacific	5	7	112	75	87
Great Lakes	-	-	9	13	15
Hawaii	-	-	-	3	3
Total	39	28	296	340	396

Note: For explanation of footnotes, see table 4.

Table 2 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, October 1964 2/

Length in feet	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
	(Number)								
27	-	-	-	-	-	-	1	-	1
28	-	-	-	-	1	-	-	-	1
29	-	-	-	-	-	1	-	-	1
31	-	-	1	-	-	-	-	-	2
32	-	-	-	-	1	-	-	-	1
33	-	-	-	-	-	1	-	-	1
36	-	-	-	-	1	-	-	-	1
37	-	-	3	-	1	-	-	-	4
38	-	-	2	-	-	-	-	-	2
39	-	-	1	-	-	-	-	-	1
40	1	-	1	-	-	-	-	-	2
49	-	-	-	-	-	1	-	-	1
50	-	-	-	-	-	1	-	-	1
53	-	-	-	1	-	-	-	-	1
55	-	-	-	-	1	-	-	-	1
56	-	-	-	-	1	-	-	-	1
61	-	-	-	1	1	-	-	1	3
64	-	-	-	-	1	-	-	-	1
65	-	-	-	-	1	-	-	-	1
66	-	-	-	1	1	-	-	-	2
68	-	-	-	-	1	-	-	-	1
72	1	-	-	-	-	-	-	-	1
73	1	-	-	-	-	-	-	-	1
74	-	1	-	-	-	-	-	-	1
148	-	-	-	-	-	1	-	-	1
152	-	-	1	-	-	1	-	-	2
Total	3	1	9	3	11	7	1	1	36

Note: For explanation of footnotes, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Tonnage and Area, October 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
	(Number)								
5-9	-	-	8	-	1	1	-	-	10
10-19	1	-	-	-	3	2	1	-	7
30-39	-	-	-	-	-	1	-	-	1
40-49	-	-	-	2	-	-	-	1	3
50-59	-	-	-	-	2	1	-	-	3
70-79	-	1	-	-	2	-	-	-	3
80-89	-	-	-	1	2	-	-	-	3
100-109	1	-	-	-	1	-	-	-	2
110-119	1	-	-	-	-	-	-	-	1
360-369	-	-	-	-	-	1	-	-	1
450-459	-	-	1	-	-	-	-	-	1
490-499	-	-	-	-	1	-	-	-	1
Total	3	1	9	3	11	7	1	1	36

Note: For explanation of footnotes, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, October 1964 2/

Horse- power	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Puerto Rico	Total
	(Number)								
60	-	-	-	-	1	-	-	-	1
85	-	-	-	-	-	1	-	-	1
100-109	1	-	1	-	-	1	-	-	3
120-129	-	-	-	-	1	-	-	-	2
130	-	-	-	-	-	1	-	-	1
145	-	-	1	-	-	-	-	-	1
160-169	-	-	1	2	-	-	-	-	3
170	-	-	-	-	1	-	1	-	2
200	-	-	-	-	-	-	-	1	1
210	-	-	3	-	-	-	-	-	3
220	-	-	-	-	2	2	-	-	4
230	-	-	-	-	1	-	-	-	1
250	-	-	-	-	1	-	-	-	1
300	-	-	1	1	3	-	-	-	5
390	-	1	-	-	-	-	-	-	1
457	1	-	-	-	-	-	-	-	1
510	1	-	-	-	-	-	-	-	1
600	-	-	-	-	-	1	-	-	1
1530	-	-	1	-	-	-	-	-	1
1800	-	-	-	-	-	1	-	-	1
Total	3	1	9	3	11	7	1	1	36

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.
 2/There was 1 redocumented vessel in October 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 25 in 1964; 1 in 1962; 1 in 1958; 1 in 1955; and 8 prior to 1949.
 3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc.
 Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-30, 1965, amounted to 3,540,035 pounds (about 168,573 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty has not been announced; however, in 1964 the quota was 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Imports in excess of the quota were dutiable at 25 percent ad valorem, but total imports were below the quota in 1964.

Note: See *Commercial Fisheries Review*, March 1964 p. 55.

AIRBORNE IMPORTS OF FISHERY PRODUCTS, NOVEMBER 1964:

Airborne fishery imports into the United States in November 1964 consisted mainly of shrimp from Venezuela and Panama. Shipments were about the same as in the previous month.

Airborne shrimp imports in November 1964 totaled 700,900 pounds, the bulk of which was fresh and frozen raw headless shrimp. Al-

U. S. 1/Airborne Imports of Fishery Products, January-November 1964 with Comparative Data						
Product and Origin 2/	1964		1964		1963	
	November		Jan.-Nov.		Jan.-Nov.	
	Qty.3/	Value4/	Qty.3/	Value4/	Qty.3/	Value4/
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Fish:						
Mexico	-	-	320.5	64.7	264.8	70.0
Canada	-	-	14.8	4.8	-	-
Other countries	51.9	23.2	82.7	60.9	108.0	120.1
Total fish	51.9	23.2	418.0	130.4	372.8	190.1
Shrimp:						
Guatemala	-	-	-	-	141.6	74.0
El Salvador	11.1	6.0	170.2	102.8	297.7	190.2
Honduras	-	-	10.3	3.8	99.8	52.3
Nicaragua	9.7	5.5	97.5	55.8	505.0	174.6
Costa Rica	-	-	310.2	166.8	598.3	284.3
Panama	120.3	79.0	1,070.4	665.4	1,541.3	831.5
Venezuela	559.8	294.6	5,805.7	2,799.5	4,500.5	2,096.8
Ecuador	-	-	-	-	111.6	39.4
France	-	-	-	-	2.6	0.9
British Guiana	-	-	10.5	5.2	-	-
Mexico	-	-	2.1	1.4	13.2	6.9
Other countries	-	-	13.1	6.9	7.9	8.6
Total shrimp	700.9	385.1	7,490.0	3,807.6	7,819.5	3,759.5
Shellfish other than shrimp:						
Canada	2.8	1.3	315.7	174.7	213.3	109.2
Mexico	-	-	14.4	9.9	101.1	60.8
British Honduras	48.9	54.2	302.6	258.1	344.5	281.8
Honduras	-	-	80.3	82.6	17.0	7.0
Nicaragua	-	-	50.5	40.0	164.5	100.0
Costa Rica	-	-	19.1	14.7	73.8	60.1
Jamaica	-	-	63.3	63.2	66.5	50.2
Other countries	50.1	56.4	108.6	82.2	117.3	103.9
Total	101.8	111.9	954.5	725.4	1,098.0	773.0
Grand total	854.6	520.2	8,862.5	4,663.4	9,290.3	4,722.6

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When the country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
4/F.o.b. point of shipment. Does not include U.S. import duties, air freight, or insurance.
Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, November 1964, U.S. Bureau of the Census.

most all of the airborne shrimp imports in November 1964 entered through the Customs District of Florida.

Spiny lobsters from British Honduras were the main shellfish item other than shrimp imported by air in November 1964.

Total airborne fishery imports in January-November 1964 were down 5 percent in quantity but only 1 percent in value from those in the same period of 1963. Airborne shipments of shrimp were down from most Central and South American countries, with the exception of Venezuela.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

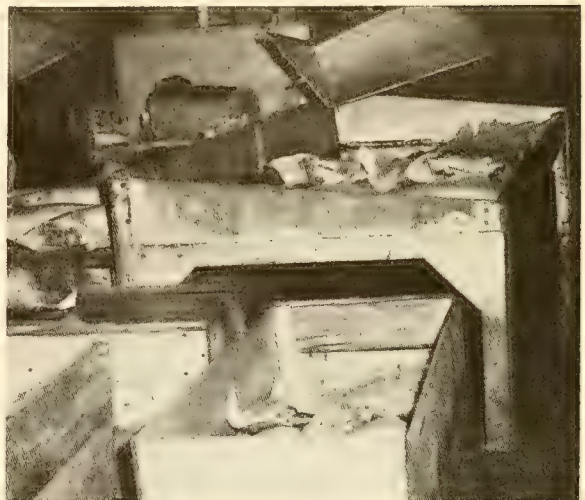


Wholesale Prices

EDIBLE FISH AND SHELLFISH, FEBRUARY 1965:

Prices for fresh and frozen fishery products in February 1965 were down 2.2 percent from the previous month. At 109.7 percent of the 1957-59 average, the February wholesale price index for edible fish and shellfish (fresh, frozen, canned) was higher by 0.6 percent as compared with the same month a year earlier.

The subgroup index for drawn, dressed, or whole finfish dropped 5.5 percent from January to February. A sharp drop in prices at Boston for ex-vessel large haddock (down 25.6 percent) was largely responsible. Also prices in February were slightly lower for frozen western dressed halibut and salmon, but higher for Great Lakes fresh fish. As compared with the same month in 1964, prices this February were sharply lower for haddock (down 38.1 percent) because of better supplies. As a result, the subgroup index this February was down 4.7 percent from a year earlier. But prices this February were substantially higher for halibut (up 30.0 percent) due to smaller stocks in cold storage as a result of the drop in the 1964 North Pacific halibut catch. Prices this February for other items in the subgroup also were up from those in the same month of 1964.



Fresh halibut on display at one of the stands, Fulton Fish Market, New York City.

From January to February, prices for fresh small haddock fillets at Boston dropped 21.7 percent and prices for shucked standard oys-

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Feb. 1965	Jan. 1965	Feb. 1965	Jan. 1965	Dec. 1964	Feb. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					109.7	112.1	109.5	109.0
<u>Fresh & Frozen Fishery Products:</u>					114.5	118.3	113.8	113.2
<u>Drawn, Dressed, or Whole Finfish:</u>					115.1	121.8	111.2	120.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.13	.17	99.2	133.3	99.5	160.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.40	117.3	118.3	118.3	90.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.85	.85	118.8	119.1	115.6	116.0
Whitefish, L. Superior, drawn, fresh.	Chicago	lb.	.65	.61	96.3	90.3	76.1	85.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.80	.75	131.0	122.8	114.6	101.6
<u>Processed, Fresh (Fish & Shellfish):</u>					115.1	116.0	111.9	114.0
Fillets, haddock, sml., skins on, 20-lb. tins . .	Boston	lb.	.44	.56	105.6	134.8	109.3	140.8
Shrimp, lge. (26-30 count), headless, fresh . .	New York	lb.	.97	.94	113.7	109.6	105.5	106.6
Oysters, shucked, standards	Norfolk	gal.	7.00	7.13	118.0	120.1	120.1	118.0
<u>Processed, Frozen (Fish & Shellfish):</u>					108.6	111.8	112.8	100.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.35	.37	88.7	92.5	92.5	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.39	.40	114.3	115.8	115.8	115.8
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.31	108.7	106.9	105.2	114.0
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.91	.95	107.9	112.1	113.8	91.3
<u>Canned Fishery Products:</u>					101.8	101.8	102.2	102.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	21.00	21.00	91.5	91.5	92.6	94.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.56	11.56	102.6	102.6	102.6	103.3
Mackerel, jack, Calif., No.1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.25	6.25	105.9	105.9	105.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	116.5
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.								

ters were slightly lower. But those lower prices were partly cancelled out by higher prices (up 3.7 percent) at New York City for South Atlantic fresh shrimp. The subgroup index for processed fresh fish and shellfish dropped only 0.8 percent from January to February. As compared with February 1964, the subgroup index this February was up 1.0 percent because of increased shrimp prices (up 6.7 percent) which practically offset (by 25 percent) lower prices for fresh haddock fillets.

From January to February 1965, prices were lower for most items in the processed frozen fish and shellfish subgroup and that index was down 2.9 percent. Although February prices at Chicago for frozen shrimp were down 3.7 percent from the previous

month, they were 18.2 percent higher than in February 1964. Prices also were down from the previous month for flounder and haddock fillets, but for ocean perch fillets they were higher. The February 1965 subgroup index at 108.6 percent of the 1957-59 average was 7.8 percent higher than in the same month of 1964 solely because of higher (18.2 percent) frozen shrimp prices.

Prices for all canned fishery products were unchanged from January to February 1965. Compared with the same month a year earlier, the index this February was down 0.2 percent. Prices this February for canned pink salmon were 3.5 percent lower and those for canned tuna were slightly lower than in February 1964. But prices for canned Maine sardines were 10.1 percent higher due to a drop in the 1964 season pack.





International

ATLANTIC FISHERIES REGULATION

PLANS FOR NORTHEAST ATLANTIC FISHERIES (POLICING) CONFERENCE:

A Northeast Atlantic Fisheries (Policing) Conference is tentatively scheduled for the fall of 1965. A number of interested countries have been invited to send fisheries experts to London on April 6, 1965, to frame an agenda for the forthcoming conference. Invitations to the preliminary meeting in April were sent by the host country (Great Britain) to France, Germany, Italy, the Netherlands, Belgium, Denmark, Norway, Portugal, Sweden, Iceland, Ireland, Spain, the U.S.S.R., Poland, Canada, the United States, and Japan.

The British invitation stems from a resolution adopted at the European Fisheries Conference (held in London, December 1963 through March 1964) which called upon the United Kingdom to convene a conference to draw up rules for the policing of fishing in the Northeast Atlantic. (United States Embassy, London, February 5, 1965.)

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

15TH ANNUAL MEETING TO BE HELD AT HALIFAX:

The 15th Annual Meeting of the International Commission for the Northwest Atlantic Fisheries (ICNAF) will be held June 7-12, 1965, at Halifax, Nova Scotia (Canada), at the Nova Scotian Hotel.

Various preliminary meetings will be held prior to the Annual Meeting. They are: (1) Fishery Assessment Subcommittee, May 28-29; (2) Herring and Other Pelagic Fish Subcommittee, May 29; (3) Research and Statistics Committee, May 31-June 4; (4) Scientific Advisers to Panels, June 5.

Note: See Commercial Fisheries Review, August 1964 p. 49.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1965:

Fishing for halibut will begin May 1, 1965, at 6 p.m. for the most important North Pacific areas (Areas 1, 2, and 3A), except in the Bering Sea (Areas 3B Northeast, 3B Northwest, and Area 3B North Triangle), and waters west of Area 3A not including the Bering Sea (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1965 fishing season. The regulations this year contained several important changes from 1964.



Fresh halibut being unloaded with a cargo net from the hold of a halibut fishing vessel at Seattle, Wash.

International (Contd.):

March 25, was the opening date for fishing in Area 3B Northeast and Area 3B Northwest. In 1964, the area designated as Area 3B North (now divided into 2 areas--3B Northeast and 3B Northwest) was opened to fishing on the same date. This year fishing in Area 3B North Triangle began on April 4, 10 days later than the opening date of March 25 last year. Area 3B South was opened to fishing on April 12 this year, 6 days later than last year's opening date on April 6. The opening date of May 1 for Areas 1, 2, and 3A is the same as last year.

The opening and closing of the various regulatory areas shall be 6 p.m. Pacific Standard Time of the date indicated, except in Areas 3B North Triangle, 3B Northeast, and 3B Northwest where the opening shall be 3 p.m. and the closing 6 p.m. local time.

Fishing areas shall be: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North Triangle--waters between a line from Unimak Pass to the Pribilof Islands north of the Aleutian Islands and east of 170° W. longitude; Area 3B Northeast--waters in Bering Sea east of 175° W. longitude and outside of Area 3B North Triangle; Area 3B Northwest--all the remaining waters in Bering Sea.

In Area 1 the fishing season, without catch limit, shall end at the same time as that in Area 2. (Last year Area 1 was open to September 15, the date on which Area 2 closed.)

In Area 2 the fishing season shall end at the time of attainment of the catch limit of 23 million pounds or on September 15, whichever is earlier. This is 2 million pounds less than last year's quota of 25 million pounds, and is 5 million pounds less than the 28-million-pound quota in 1963. The catch limit in Area 2 in 1964 was not attained by September 15 when the season closed. As of September 2, the Area 2 catch was only 17.6 million pounds. The final catch was about 5 million pounds less than the quota.

In Area 3A the fishing season shall end at the time of attainment of a catch limit of 34 million pounds or on October 15, whichever is earlier. The catch limit is the same as

last year. In 1964 Area 3A closed on August 19.

In Area 3B South the fishing season shall end at the time of attainment of a catch limit of 4 million pounds or on October 15, whichever is earlier (the closing date last year was October 15 and the catch limit was the same).

In Area 3B Northeast the fishing season, without catch limit, shall end on June 20, and in Area 3B Northwest the fishing season, also without catch limit, shall end on November 15. Last year fishing in the area designated as 3B North ended on October 15.

In Area 3B North Triangle the fishing season shall end on April 11 after a fishing period of 7 days. Last year Area 3B North Triangle had a catch limit of 6,393,340 pounds or closure on October 15, whichever was earlier. That catch limit was to be shared among Canada, the United States, and Japan. Fishing in Area 3B North Triangle was very poor in 1964 with only 1.6 million pounds taken by United States and Canadian fishermen as of September 2. In 1964 fishing ended October 15 and only about one-third of the quota had been caught.

The Commission in 1965 will provide 10 days' notice of closure in Areas 1 and 2, 18 days' notice of closure in Area 3A, and at least 18 days' notice of closure in Area 3B South.

The Commission's recommendations for the 1965 season were announced on January 21 at the conclusion of its 41st annual meeting at Vancouver, B.C., Canada, with Chairman Harold E. Crowther of Washington, D.C., presiding.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its function is the development of the halibut stocks to levels that will permit the maximum sustained yield. Its decisions regarding regulation are based on scientific findings of its staff.

A public session was held on January 19 at which time the research conducted by the scientific staff and this past year's fishery were reviewed. On January 21, a meeting was held with the Conference Board, which consists of representatives of fishermen's unions,

International (Contd.):

vessel owners, and with representatives of dealer organizations, at which time the Commission received various industry proposals for regulation of the fishery in 1965.

During executive sessions the Commission dealt with administrative matters and approved a research program for 1965 which will include several fish tagging operations in Hecate Strait, and in the Gulf of Alaska and Bering Sea. In addition to those field activities, monitoring of the effects of foreign fishing on the stocks of Pacific halibut will also be greatly increased.

The Commission announced that the 1966 annual meeting will take place at Seattle, Wash. The date was not specified. Dr. William M. Sprules of Ottawa, Ontario, was elected chairman and Harold E. Crowther, vice-chairman, for the ensuing year.

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain that the 1965 regulations as recommended by the Commission will be approved by the two Governments.

Note: See Commercial Fisheries Review, May 1964 p. 43.

INTERNATIONAL PACIFIC SALMON
FISHERIES COMMISSIONREGULATIONS FOR 1965 SOCKEYE AND
PINK SALMON FISHERY
IN NORTH PACIFIC:

The tentative suggestions for regulatory control of the 1965 sockeye and pink salmon fishery in North Pacific Convention waters, as submitted to the fishing industry on December 11, 1964, were reconsidered on the basis of suggestions made by the Advisory Committee at a meeting of the International Pacific Salmon Fisheries Commission on January 29, 1965.

Action taken by the Commission in view of the Committee's recommendations is as follows:

1. The closure to all net fishing in both Canadian and United States Convention waters lying westerly of the Angeles Point-William Head line originally recommended to be "June 23 (6:00 a.m.) to July 31" was changed to read "June 27 to July 31."

2. An official policy was adopted on the weekly starting time for gill nets and purse seines in those

Canadian Convention waters lying westerly of the William Head-Angeles Point line: namely, that gill nets would start first each week for the fishing season of 1965 as originally recommended on December 11, 1964. Purse seines would start first in 1966 with the weekly starting time for each gear alternating each year thereafter.

3. Commencing September 5 the fishing time for gill nets in Canadian Convention waters lying westerly of the William Head-Angeles Point line was changed to read 7:00 p.m. to 7:00 a.m. and purse seines to 7:00 a.m. to 7:00 p.m.

4. To achieve conformity in the precedence of fishing time for purse seines, reef nets, and gill nets in United States Convention waters, the scheduled period for purse seines and reef nets starting first each week was changed from "June 27 to July 31" to "June 27 to August 7." Commencing August 8 and extending to the end of Commission controls gill nets would start first for each weekly fishing period.

5. The date for relinquishing control in any section of Convention waters will be reconsidered at appropriate times throughout the fishing season.

CANADIAN CONVENTION WATERS:

West of William Head-Angeles Point Line and East of Bonilla-Tatoosh Line:

- | | |
|-----------------------------|--|
| June 27 to July 31 | - Closed to all net fishing. |
| August 1 to August 14 | - Gill nets open daily 6:00 p.m. to 6:00 a.m.
Sunday afternoon to Tuesday morning of each week |
| | - Purse seines open daily 6:00 a.m. to 6:00 p.m.
Monday and Tuesday of each week |
| August 15 to September 4 | - Gill nets open daily 6:00 p.m. to 6:00 a.m.
Sunday afternoon to Wednesday morning of each week. |
| | - Purse seines open daily 6:00 a.m. to 6:00 p.m.
Monday, Tuesday, and Wednesday of each week. |
| September 5 to September 18 | - Gill nets open daily 7:00 p.m. to 7:00 a.m.
Sunday afternoon to Wednesday morning of each week. |
| | - Purse seines open daily 7:00 a.m. to 7:00 p.m.
Monday, Tuesday, and Wednesday of each week. |
| August 13 to September 19 | - Closed to commercial hook-and-line fishing on Saturday and Sunday of each week. |
| | - Relinquish control. |

East of William Head-Angeles Point Line Including Areas 17, 18, That Portion of Area 19 Lying Easterly of the Referenced Line and District No. I:

- June 27 to August 28 - Open 8:00 a.m. Monday to 8:00 a.m. Wednesday of each week.

International (Contd.):

August 29 to October 9 Open 8:00 a.m. Monday to 8:00 a.m. Tuesday of each week except for the week commencing September 12 when all net fishing will be prohibited.

October 10 - Relinquish control.

Special Troll Restrictions:

Fishing for sockeye or pink salmon other than by angling or trolling for the purpose of personal consumption and not for sale or barter shall be prohibited in these Convention waters of Canada (the waters of Howe Sound excepted), lying easterly and inside of a straight line projected from Gower Point at the westerly entrance to Howe Sound to Thrasher Rock light, thence in a straight line to Salamanca Point on the southerly end of Galiano Island, thence in a straight line to east Point on Saturna Island, thence in a straight line towards Point Roberts light to the intersection with the International Boundary line, thence following the International Boundary line to its intersection with the mainland from the 22nd day of August to the 9th day of October, both dates inclusive, except at the times that net fishing other than with spring salmon nets may be permitted within that area.

UNITED STATES CONVENTION WATERS:

West of Angeles Point-William Head Line and East of Bonilla-Tatoosh Line:

June 27 to July 31 - Closed to all net fishing.

August 1 to August 7 - Gill nets open daily 7:00 p.m. to 9:00 a.m.
Monday afternoon to Wednesday morning of each week.

- Purse seines open daily 5:00 a.m. to 9:00 p.m.
Monday and Tuesday of each week

August 8 to August 28 - Gill nets open daily 7:00 p.m. to 9:00 a.m.
Sunday afternoon to Tuesday morning of each week

- Purse seines open daily 5:00 a.m. to 9:00 p.m.
Monday and Tuesday of each week.

August 29 to September 18 - Gill nets open daily 7:00 p.m. to 9:00 a.m.
Sunday afternoon to Wednesday morning of each week.

- Purse seines open daily 5:00 a.m. to 9:00 p.m.
Monday, Tuesday, and Wednesday of each week.

August 13 to September 13 - Closed to commercial trolling on Saturday and Sunday of each week.

September 19 - Relinquish control.

East of Angeles Point-William Head Line:

June 27 to August 7 - Gill nets open daily 7:00 p.m. to 9:00 a.m.

August 8 to August 28

Monday afternoon to Wednesday morning of each week.

- Purse seines and reef nets open daily 5:00 a.m. to 9:00 p.m. Monday and Tuesday of each week.

- Gill nets open daily 7:00 p.m. to 9:00 a.m.
Sunday afternoon to Tuesday morning of each week.

- Purse seines and reef nets open daily 5:00 a.m. to 9:00 p.m. Monday and Tuesday of each week.

August 29 to October 2

- Gill nets open daily 7:00 p.m. to 9:00 a.m.
Sunday afternoon to Wednesday morning of each week.

- Purse seines and reef nets open daily 5:00 a.m. to 9:00 p.m. Monday, Tuesday, and Wednesday of each week

September 5 to September 18

- Waters westerly of a straight line projected true south from Lily Point to the intersection with the International Boundary line will be closed to all net fishing.

September 19 to October 2

- Waters westerly of a straight line projected from Iwer-sen's dock on Point Roberts towards Georgina light at Active Pass to the intersection with the International Boundary line will be closed to all net fishing.

October 3 - Relinquish control.

Notes: (1) Times are based on Pacific Daylight Saving Time.

(2) See Commercial Fisheries Review, March 1965 p. 60; April 1964 p. 45.

KING CRAB

U. S.-SOVIET AGREEMENT ON KING CRAB FISHING ON U. S. CONTINENTAL SHELF OF NORTH PACIFIC:

An agreement on fishing for king crab on the U. S. Continental Shelf in the North Pacific was signed by the United States and the Soviet Union on February 5, 1965, at Washington, D.C. Signing of the agreement concluded several weeks of consultations between the two countries.

The two countries agreed that in accordance with the provisions of the United Nations Convention on the Continental Shelf, the king crab is a resource of the Continental Shelf over which the coastal nation has sovereign rights for the purposes of exploration and exploitation. The consultations took into account that the Soviet Union has maintained a king crab fishery for several years on the United

International (Contd.):

States Continental Shelf in the eastern Bering Sea and in other areas of the Northeastern Pacific, and that United States fishermen have at present only a small fishery for king crab in the eastern Bering Sea. Because of those factors, the United States agreed that Soviet fishermen may continue to fish in the eastern Bering Sea for two years at a reduced level of catch. Soviet fishermen will not fish for king crab in other areas of the United States Continental Shelf.

The agreement also provides for conservation measures to be applied to the crab fishermen of both countries in the eastern Bering Sea for continued and intensified scientific study of the king crab resource there, and for enforcement of the terms of the agreement. The agreement specifies a substantial sub-area in which only crab pots, the type of gear used by United States fishermen, will be used for commercial crab fishing. The two Governments will hold further consultations prior to the end of the two-year period.

The desirability of consultation with other countries prior to implementation of the U.S. Continental Shelf provisions of Public Law 88-308 (so-called Bartlett Act) was pointed out by President Johnson in his statement May 20, 1964, when he signed the law. Consultations were held between the United States and Japan in fall 1964 regarding the Japanese crab fishery in the eastern Bering Sea, and an interim two-year agreement was signed November 25, 1964.

Note: See Commercial Fisheries Review, February 1965 p. 51.

FISH MEAL

WORLD PRODUCTION, NOVEMBER 1964:

World fish meal production in November 1964 was up about 43 percent from the same month in 1963 due mainly to a sharp increase in Peruvian output. (Editor's Note: The Peruvian Government is reported to be con-

World Fish Meal Production by Countries, January-November 1963-1964				
Country	Nov.		Jan.-Nov.	
	1964	1963	1964	1963
. (Metric Tons).				
Canada	5,971	8,338	50,594	72,921
Denmark	8,881	5,559	104,526	92,729
France	1,100	1,100	12,100	12,100
German Fed. Rep.	5,239	4,775	68,784	68,567
Netherlands	1/	700	2/6,700	6,300
Spain	1/	2,875	1/	21,687
Sweden	1,005	783	6,978	5,957
United Kingdom	5,286	4,894	69,093	68,651
United States	8,093	12,079	3/183,768	207,458
Angola	5,241	2,990	52,716	24,384
Iceland	3,177	750	118,486	79,017
Norway	13,099	12,076	175,729	121,983
Peru	181,673	116,167	1,371,235	1,019,604
So. Afr. (incl. S.-W. Afr.)	9,700	4,269	260,628	237,341
Belgium	375	375	4,125	4,125
Chile	9,641	3,698	134,620	79,575
Morocco	350	1/	3/18,450	1/
Total	258,831	181,428	2,638,532	2,122,399
1/ Data not available 2/ Data available only for Jan.-Oct. 1964. 3/ Revised. Source: International Association of Fish Meal Manufacturers. Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.				

sidering the introduction of catch limits to conserve fish resources.)

World fish meal production in the first 11 months of 1964 was considerably above that in the same period of 1963. The increase was due largely to expanded production in Peru which accounted for about 52 percent of world output during January-November 1964. Higher production during January-November 1964 was also reported in Norway, South Africa, Chile, Iceland, Angola, and Denmark. The increase was partly offset by lower production in Canada and the United States.

MARINE OIL

WORLD PRODUCTION,

1960-1964 AND FORECAST 1965:

World production of marine oils in 1964 was up slightly from 1963, but below output in 1961 and 1962. A steady decline in baleen whale oil production since 1961 has not been

World Marine Oil Production^{1/}, Average 1955-59, Annual 1960-1964, Forecast 1965

Item	Forecast 1965	2/ 1964	1963	1962	1961	1960	Average 1955-59
. (1,000 Short Tons)							
Baleen whale oil	230	250	295	390	428	418	427
Sperm whale oil	155	170	149	130	120	122	119
Fish and fish-liver oil	735	710	655	750	669	511	428
Total	1,120	1,130	1,099	1,270	1,217	1,051	974

1/ Data are estimates based on official statistics of foreign governments, other foreign source materials, reports of U. S. Agricultural Attaches and Foreign Service Officers, and other sources.

2/ Preliminary.

International (Contd.):

offset by the modest increase in sperm oil production. Fish oil output has held fairly steady since 1961 with production averaging close to 700,000 short tons annually.

Total production of marine oils in 1965 is expected to be about the same as in 1964. World productive capacity for fish oil increased slightly in 1964. This could result in somewhat higher output of fish oil in 1965 if catch results and yields are favorable. Any increase in fish oil, however, will probably be offset by lower production of whale oil in the Antarctic. (U. S. Department of Agriculture, World Agricultural Production and Trade, January 1965.)

Note: See Commercial Fisheries Review, October 1964 p. 46.

EUROPEAN ECONOMIC COMMUNITY

FISH LANDING RIGHTS IN MEMBER COUNTRIES:

A new regulation of the European Economic Community (EEC) allows its fishermen to land fish in any member country by obtaining a certificate known as D. D. 5. The "D. D. 5" regulation came into force November 1, 1964.

French fishermen claim the new regulation is a threat to their minimum price structure, and the French Government has requested the postponement of the regulation.

In reply to the French opposition, spokesman for EEC Headquarters in Brussels said, "The right to land fish in member countries has existed ever since the Treaty of Rome came into effect, but the new regulation insures that minimum prices maintained in the various countries will be recognized." (The Irish Skipper, December 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 93.

LATIN AMERICAN FREE TRADE ASSOCIATION

FOURTH ANNUAL CONFERENCE:

The Fourth Annual Conference of the Latin American Free Trade Association (LAFTA) was held late in 1964 at Bogota, Colombia. The Conference resulted in various tariff cuts by individual countries and also produced the group's first common schedule. The common schedule (products which will be completely free of duties in intra-LAFTA trade by 1973) was signed by all members of LAFTA, except Uruguay. An escape clause mechanism was created for agricultural imports within

LAFTA after 1973. The common schedule includes 113 products which account for slightly more than 25 percent of present intra-LAFTA trade.

The Conference also approved a resolution on goals other than tariff reduction. The resolution sets forth some ambitious programs for LAFTA including a study for the establishment of a credit system for LAFTA trade, and a LAFTA policy on the location of new industry.

Some of the proposals presented at the Conference, such as automatic linear tariff reductions and LAFTA payments system, were not seriously considered by the negotiators but simply passed on to the permanent organization for study.

A meeting of the Foreign Ministers of the LAFTA countries, accompanied by other ministers in charge of LAFTA affairs, is scheduled to take place some time between April 1 and August 31, 1965. The Fifth Annual LAFTA Conference will be held in Montevideo, Uruguay, from October 19 to December 4, 1965. (International Commerce, January 25, 1965.)

FOOD AND AGRICULTURE ORGANIZATION

SYMPOSIUM ON INCREASING FISH CONSUMPTION HELD AT 11TH SESSION OF INDO-PACIFIC FISHERIES COUNCIL:

A symposium on "Increasing Fish Consumption by Improved Handling and Distribution" was held during the 11th Session of the Indo-Pacific Fisheries Council (IPFC) at Kuala Lumpur, Malaysia, October 16-31, 1964.

Some 37 papers on 9 main topics were given at the symposium which among others included: (1) technology and economics of ice production; (2) handling and icing fresh fish aboard vessels and at shore; (3) use of preservatives to extend keeping time of fresh fish; (4) marketing, cooperatives, etc.; (5) inspection and quality control; and (6) consumer education.

Conclusions arrived at from the symposium were that working papers and discussions held provided ample material on the present status of research done in the fields considered, as well as on practical developments in the region covered. But what is urgently required, it was felt, is the application of the knowledge that is available, and taking into consideration the

International (Contd.):

specific influence of local conditions, social structure, consumer demand, etc.

It was proposed that a Working Party on Fresh Fish Preservation be established and that member Governments compile information on fresh fish handling and distribution for consideration by the Working Party. (IPFC Current Affairs Bulletin No. 41, December 1964.)

Note: See Commercial Fisheries Review, March 1965 p. 64.

INTERNATIONAL INDIAN OCEAN EXPEDITION

FISHERY OBSERVATIONS DURING RESEARCH VESSEL "ANTON BRUUN" CRUISE OFF EAST AFRICA:

During September-November 1964, the oceanographic research vessel Anton Bruun operated off the east coast of Africa as part of the International Indian Ocean Expedition. Observations of a U. S. Bureau of Commercial Fisheries scientist who participated in that cruise follow:

In Durban harbor (South Africa) in late September 1964, there were 3 long-line vessels (2 of Taiwan and 1 of Japanese registry) all landing frozen tuna for storage and transshipment for a Japanese company. The 2 vessels from Taiwan were older than the one from Japan but all had facilities for blast-freezing their catches and for separate frozen fish storage. All had conveyor-belt arrangements for transfer of gear from the working area forward to the storage area near the stern.

No great amount of fishing is done out of Durban. In September some whales were being landed. They were towed from catcher boats to a marine railway near the mouth of the harbor where they were unloaded and moved (on flat cars) to a plant where they are



Shows a finback whale being transported by flat car to a Durban processing plant.

efficiently disassembled. One new product being produced from the whales is something like a beef bouillon cube.

From the time the Anton Bruun left Durban on September 25 until arrival at Mombasa on November 9, no commercial fishing vessels larger than a rowing skiff were seen other than one of the long-line vessels previously seen in Durban Harbor.

Fishing trials during this cruise did not produce much to indicate the presence of exploitable fishery resources. But there were indications of the presence of good concentrations of penaeid shrimp and "European" lobsters (Ne-phrops) in depths of 200-250 fathoms off Delagoa Bay (Lourenco Marques) Mozambique. A catch of very large shrimp (Peneus) was made off Formosa Bay, Kenya, in shallower water

Note: See Commercial Fisheries Review, September 1964 p. 16.

UNITED NATIONS

SPECIAL FUND ASSISTS FISHERY RESEARCH IN LOW-INCOME COUNTRIES:

Assisting research into the seas' resources and to the development of fishing industries is only a small part of the wide range of activities of the United Nations Special Fund. Such assistance is designed to accelerate economic progress throughout the world.

World food production has increased only slowly in recent years and has not been able to keep pace with the rapid increase in the world's population. If further and increasingly widespread malnutrition and hunger in the low-income countries is to be prevented, new sources of food must be developed. To feed their growing populations, nations are turning more and more to the sea. Because the sea is a potential economic resource of great magnitude, the United Nations Special Fund has been helping Governments exploit the resources and wealth within their seas. This is done under that organization's program of assistance by providing surveys of natural resources, applied research, and training. The total cost of the program is now more than \$1 billion, which represents a partnership investment with funds provided through the voluntary contributions of 112 Governments and by the recipient countries themselves.

The Special Fund is presently assisting 16 ocean and inland fisheries projects at a total cost of \$39 million. Eight of those projects are already under way; 8 more projects have been authorized by the Governing Council of the Special Fund and work on them is about to commence. All of those projects are being executed for the Special Fund by the Food and Agriculture Organization (FAO) of the United Nations.

FISHERY EXPANSION IN LATIN AMERICA: The fishery industries of Latin America's Pacific Coast have rapidly expanded in recent years. Chile, Peru, and Ecuador are all countries that have in the past depended heavily on exports of a single major product. In spite of long coastlines, those countries have had no tradition as seafaring nations. In the last five years,

International (Contd.):

however, all this has changed and the economy of the three countries has been transformed by a great "rush to the sea."

PERU: To a great extent, the lead in this development was given by Peru's fishing industry, and in each case the process of transforming traditional patterns and methods into modern techniques is being accomplished by similar means. At the beginning of major economic development of the fishing industry it was realized that it would be necessary to set up a special controlling institute to supervise the development of those fisheries and to gather information by research that could then be analyzed and published as routine statistics.

The situation in Peru is unique in the unusually heavy dependence of the fishing industry on anchoveta, the raw material for fish meal production which represents 98 percent of Peru's fishery catch. With an export value in 1962 of \$100 million, anchoveta are Peru's largest foreign currency earner. That fishery is such that even a slight change in the abundance or the distribution of fish could violently shake the structure of the whole industry. This could be brought about by factors so slight as an infinitesimal change in the temperature of the water, or a small movement of the dominant offshore currents. The unique feature of the \$1.7 million Peruvian Sea Institute, which was established in 1960 and is being assisted over a four-year period by the Special Fund, is that it was built not to develop an industry, but to study the biological basis of an already established industry and extend the potential of its development.

The Institute's research is being carried out with two vessels, the *Unanue* and the *Explorador*. The biological and oceanographic information that has been collected is then analyzed by six laboratories. The work undertaken by the Institute recently took on an added importance in view of a marked decline in anchoveta catches. Information that was obtained while investigating this catch decrease showed that seasonal changes in the trade-wind pattern affected the upwelling of nutrient-rich waters and as a result, the concentration of marine organisms. The need for systematic information on seasonal variations in the Peruvian Sea-region was emphasized. The continuing reports of the Institute are proving of great value in interpreting sea conditions and fishing prospects.

CHILE: With its extremely long coastline stretching 2,600 miles from the tropics to the Antarctic, Chile has access to abundant fish resources, capable of supporting a large fishery industry. Although the development and utilization of those resources is important for the nourishment of a population of 8 million, expansion and new investment have hitherto been hampered due to: (1) a lack of detailed biological and economic knowledge, (2) lack of modern vessels and fishing gear, and (3) inadequate methods of catching, processing, and marketing.

The \$4.5 million Fisheries Development Institute, which began operations in November 1963, is providing the Government of Chile with the technical basis for accelerated development within the current ten-year development plan. Studies are being made of the nature, distribution, and density of marine resources, the improvement of fishing methods and the economics of exploitation. The Special Fund is assisting the Institute over the first four years of operation. During those

years, emphasis is given to studies of the anchovy fishery in Northern Chile because of its importance to the fish meal industry and of the "merluza" in Southern Chile in view of the possibility of substantial exports of that fish species.

Two laboratories have been established in Northern Chile. One is being used for quality control based on chemical analysis of fish meal and oil. The other laboratory, located in one of the fish meal factories, is investigating methods of utilizing stickwater. Another laboratory is scheduled to be built at the Institute's headquarters in Santiago.

ECUADOR: The first real direct exploration of the waters off Ecuador's coast is being promoted by the \$1.3 million National Fishery Institute which was established in 1960, and is being assisted over a four-year period by the Special Fund. That Institute has conducted extensive studies on the distribution and density of marine resources and the best means of exploiting those resources. Among a wide range of activities the Institute is sponsoring has been the improvement of the quality of shrimp exports by individual rather than bulk freezing, and the use of dried and salted fish.

REGIONAL PROGRESS: Apart from their national work the three Institutes are also taking part in a joint oceanographic program which also includes Colombia, Panama, and the Inter-American Tropical Tuna Commission. This consists of a study of the periodic warming of coastal waters known as the "El Niño Phenomenon," which is thought to have a considerable effect on the distribution of fish in the Pacific.

NIGERIA: Like the Pacific, the Eastern Atlantic Ocean has wide areas of underexploited fishing grounds. In Nigeria, for example, half of the estimated 100,000 metric tons of fish that is consumed annually is imported. The present inadequacy of marketing arrangements has resulted in a shortage of fish in the interior markets of that country. There is an urgent need to improve production through modern fishing methods and through raising the quality of the fish catch.

The Special Fund is assisting the Governments of the western and mid-western regions of Nigeria with a four-year survey of their available fishery resources. The cost of the survey is \$829,000 and is being carried out in two phases. The first phase will be devoted to the collection of basic information to determine the most economic way of catching fish and then distribution of the catch from a central collecting point. The second phase will involve demonstration and pilot schemes in both inland and ocean fishing.

The general fisheries survey was completed in June 1964. Studies were made of the existing methods and equipment used in both the inland waters and the trawl fishery in Lagos. The present methods of fish handling, storing, marketing, and distribution were also appraised. A report is to be prepared on that survey. At the same time in Lagos and Avietore, demonstrations and training were given by experts in the construction and operation of various types of fish nets and of fish smoke-drying.

ZAMBIA AND RHODESIA: In the Central African area the Governments of Zambia and Rhodesia are giving their support over four years to the \$1 million Lake Kariba Fisheries Research Institute. With the aim of fostering the sound development of a fishing industry and ancillary activities in the Lake Kariba area, the

International (Contd.):

Institute has since October 1963 been conducting a physio-chemical and biological survey of the Lake. Studies have been made both of methods of fishing and of the types of fish and their size. When those studies are completed, the surveys will provide valuable data for the development of a major inland fishing area.

INDIA: The present diet of the great majority of the population of India is too heavily dependent on the single staple product of grain. The development of a modern fishing industry would go a good part of the way towards remedying such a deficiency. With this end in view, the Government of India established in 1958 a committee to review the training of fisheries officers. The Special Fund is assisting that Government for three years with the establishment of a \$1.3 million Fisheries Training Institute in Bombay, to train District Fishing Officers for both the Central and State Governments, and managers for the fishing industry. Through the work of the Institute, leaders are being provided who are trained in the techniques of developing and exploiting inland and marine fisheries.

Good results have already been achieved by the Institute. The Mysore State Government has been so impressed by what has been achieved in the first training courses that it has ruled that recruits for supervisory posts in its fisheries department must have a diploma from the Fisheries Institute. It is believed that other States will shortly make similar rulings.

KOREA: The fishing industry of Korea was built up after 1952 with extensive United Nations assistance. But for the most part, the industry still is a small operation and present fishing grounds are all near the coast. If Korea is to take a place among the modern large-scale fishing countries, "offshore" fishing will have to be developed. Surveys indicate that this will be possible over the next ten years.

The Korean fishing industry will directly benefit from a \$2.26 million Deep-Sea Fishing Center in Pusan which has just been established by the Government and which is being supported by the Special Fund during the first five years. This Center will become the basis of the country's fishery training system and will offer technical training both ashore and at sea, to graduates of colleges and other vocational schools as well as the fishermen. It is hoped that the trainee output of the Center will be between 50 and 75 graduates a year, a number that should be immediately absorbed by the industry.

OTHER SPECIAL FUND FISHERY PROJECTS: In a number of other areas, Special Fund fishery projects have been approved and will shortly be carried out. In the Caribbean a major investigation of fishing techniques and marketing is being assisted by the Special Fund for four years at a cost of \$2.2 million. That study will, it is hoped, lead to the expansion of fisheries through the exploitation of fish species that are presently untouched. Deep-sea fishing in the Philippines, which in spite of considerable offshore resources is at present heavily dependent upon imports of fish, will be promoted through studies and training that will be carried out on several experimental fishing vessels with Special Fund assistance over five years at a cost of \$3 million.

Another six fishery development projects in the new program of 66 requests for Special Fund assistance have recently been approved by the 13th Session of the Governing Council of the Special Fund. In Taiwan, the Special Fund is giving assistance over a four-year period to the establishment of a \$7.5 million Institute at Taipei, which will work for the modernization of the shipping industry and will train cadet officers for the merchant marine service.

A \$2.2 million fishery research unit in Ghana will be supported during its first five years and will carry out the studies required for forming the basis of a rapid increase in fishery production from available resources. A survey of the fisheries in East Pakistan will also be made over a five-year period at a cost of \$1.6 million which will assess the potential for increased production, and develop a core of competent and skilled fishermen.

The development of the fishing industry in Argentina will be assisted over five years at a cost of \$3 million through exploratory and experimental fishing conducted with associated biological and hydrographic studies. The Special Fund will also assist Governments with with two regional projects: (1) one costing \$4 million designed to assist for six years the strengthening of fishery administrations in Central America and to improve processing and marketing methods; (2) the other aimed at the development and management of fresh-water fisheries in Kenya, Uganda, and the United Republic of Tanzania over a five-year period at a total cost of \$1.3 million. (United Nations, New York.)



Australia

TUNA SURVEY OFF TASMANIA
PLANNED FOR 1965:

Hopes are high that the planned joint tuna searching program off Tasmania in 1965 will further stimulate that Australian State's fishing industry. The survey will be undertaken between January and June by two chartered tuna vessels supported by a spotting aircraft.

A joint statement by the Commonwealth Minister for Primary Industry and the Tasmanian Minister for Agriculture said that the cost of the survey would be shared equally by the Commonwealth (from the Fisheries Development Trust Account) and the State.

With the reopening of canning factories in Tasmania, the processing of tuna (should the fishery become established in waters adjacent to Tasmania), barracouta, and Australian salmon should no longer present problems.

Other major developments in the Tasmanian fishing industry during 1964 included: (1)

Australia (Contd.):

The extension of scallop dredging to new areas off the east coast, leading to an extension of the season; (2) the construction of 8 new vessels for the State's spiny lobster fishery (those replace vessels which have transferred to Victoria, and others sold to fishermen in other Australian States); and (3) the development of facilities for fishermen at fishing ports. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 75.

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TUNA FISHERY TRENDS, 1936-64:

Australia's tuna landings increased spectacularly in the 1963/64 season, with a record catch of 9,000 short tons, more than double the tuna catch in the previous season. The tuna catch is now the greatest in quantity of any finfish landed in Australia.

Most of the tuna is canned in factories at or close to the two main tuna ports--Port Lincoln in South Australia and Eden in New South Wales. The canned product is practically all sold on the local market, with only small exports mainly to the Pacific Islands. Production of canned tuna in 1963/64 was about 4.7 million pounds, an increase of 135 percent over the 1959/60 output of 2 million pounds. Consumption of canned tuna in Australia has risen from about 3.2 ounces per capita in 1959/60 to about 7.5 ounces in 1963/64.

Frozen tuna (round) has been exported from Australia for several years, mainly to the United States. In 1963/64, Australia's total exports of frozen round tuna amounted to 3.3 million pounds, worth A£204,000 (US\$457,000).

The presence of tuna in Australian waters in possible commercial quantities was established in 1936 when aerial surveys of pelagic fish were pioneered. But until 1949 Australian fishermen neglected tuna, mainly because sporadic catches could not justify a canning industry and because trolling (which was then the only known way of catching tuna) was relatively slow. Canneries were in operation at Narooma and Eden, but both of them concentrated on Australian "salmon" (*Arripis trutta*). The canneries merged in 1949 and New South Wales fishermen, who were then experiencing a lean time, were offered 6 pence a pound live-weight for tuna landed. Tuna production

in 1949, using trolling gear, was about 1,000 tons of bluefin.



Fig. 1 - Australian tuna vessel.

In 1950/51, the Australian Commonwealth Government chartered the 63-foot United States-Fijian tuna clipper *Senibua*, which spent four months in Australian waters assessing the value of the pole-and-live-bait fishing method. Results were encouraging, and the industry began to gear itself to take advantage of the annual tuna runs off the southern New South Wales coast.

The first Australian vessel built especially for tuna pole fishing was the *Fair Venture* which was launched in late 1951. After a disappointing first season in New South Wales, the vessel went to South Australia. The first tuna poled by a commercial vessel in South Australia were taken by the *Fair Venture* in 1952. Facilities to handle the catch were then inadequate, and further development of the South Australian fishery was delayed until 1956. In that year, two Californian tuna fishermen were invited by the South Australian Government to undertake exploratory pole-fishing for tuna. Other South Australian vessels followed suit, and after a few seasons of preparation and consolidation, the fishery began to assume its present proportions.

Australia (Contd.):



Fig. 2 - Pole-and-line fishing for bluefin tuna off southern Australian coast.

The Australian tuna fleet in 1963/64 consisted of 37 vessels in New South Wales, ranging between 21 and 105 feet in length, and 14 vessels in South Australia, from 48 to 85 feet long.

The mainstay of the tuna fishery since its inception in Australia has been the southern bluefin (*Thunnus thynnus maccoyii*). The schools are exploited during their surface-swimming phase, when their weight ranges between 20-80 pounds. As they grow larger, they move into deeper water layers, at which time they become the target, along with other species, for Japanese long-liners in the eastern Indian Ocean and the southwest Pacific. Southern bluefin tuna is thus the basis of an international fishery exploited in two distinct stages.

Yellowfin tuna (*Neothunnus macropterus*) are known to frequent Australian waters, and

have been taken in southern New South Wales waters. The spatial distribution of yellowfin in that area makes them more accessible to long-line fishing. Since 1963, a small but developing fishery for large adult yellowfin has been operated by Australian fishermen, using a modified long line.

Striped tuna or skipjack (*Katsuwonus pelamis*) occur on a definite seasonal pattern between Coff's Harbour (New South Wales) and St. Helen's (Tasmania). In 1963, experimental fishing with monofilament nylon gill nets was undertaken for skipjack off Lakes Entrance, Victoria, with some success. Marketing difficulties at present inhibit the further development of that fishery, which produces fish of from 8 to 16 pounds, which canneries regard as smaller than can be economically handled at the standard prices paid for tuna.

Australian tuna vessels range in size from 21-foot trolling vessels to 105-foot clippers. Most of the tuna is caught by the live-bait-pole fishing method with small quantities taken



Fig. 3 - U. S. tuna fishing expert unloading bluefin tuna from the Port Lincoln vessel Tacoma.

Australia (Contd.):



Fig. 4 - Southern bluefin tuna (*Thunnus thynnus maccoyii*) distribution and fishing grounds in waters off Australia and New Zealand.

by trolling, and some striped tuna being caught with monofilament nylon gill nets.

Although many small vessels have live-bait tanks, the major portion of the catch is taken by vessels of from 60 to 100 feet long, some of which have been designed specifically for tuna fishing, others being conversions from various types of vessels. The larger vessels use refrigerated sea water to hold their catch for periods of up to 5 or 6 days, and smaller vessels, which generally make shorter trips, and often return to port daily on the east coast, use ice as required. (Australian Fisheries Newsletter, January 1965.)

Note: See *Commercial Fisheries Review*, November 1964 p. 75; September 1964 p. 56.

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FISHERIES TRENDS, FISCAL YEAR 1963/64:

Highlights: During fiscal year 1963/64, Australian fishermen developed new scallop

grounds off Victoria and landed record tuna catches in New South Wales and South Australia to boost total Australian landings of fish and shellfish to a record level. The value of Australian exports of fishery products also rose to a record level in 1963/64 as new markets were developed for scallops and abalone. But Australian imports of fishery products continued to exceed fishery exports in 1963/64, because domestic landings could not satisfy the growing demand in Australia. There is a particularly strong demand in Australia for imported frozen fillets in consumer packs.

Landings: Australian fishery landings in fiscal 1963/64 (July 1963-June 1964) were up 10 percent in quantity and 5 percent in value from the previous fiscal year. Main reasons for the increase were larger catches of tuna and scallops.

The Australian tuna catch rose from 11 million pounds in 1962/63 to 17.9 million

Australia (Contd.):

Table 1 - Australia's Fishery Landings by States, 1962/63 and 1963/64^{1/}

Species	New South Wales		Victoria		Queensland		South Australia		Western Australia		Tasmania	
	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63	1963/64	1962/63
(1,000 Pounds)												
Finfish	32,819	31,598	13,448	12,611	8,919	9,041	20,357	16,137	8,807	8,017	2,774	2,879
Spiny lobster .	400	498	823	1,531	10	31	4,325	4,650	18,500	21,380	3,572	3,310
Shrimp	6,107	6,623	-	3	5,118	4,971	-	-	2,118	1,017	-	-
Crab	103	228	-	-	571	571	-	-	26	36	-	-
Oyster	12,462	12,604	50	63	170	330	404	-	6	28	2	1
Scallop	-	-	10,967	-	846	627	-	-	18	-	4,260	5,871
Other shellfish	64	22	536	867	114	119	1,699	-	221	8	-	-
Total	51,955	51,573	25,824	15,075	15,748	15,690	26,785	20,787	29,696	30,486	10,608	12,061

Note: See table 2 for footnotes.

Table 2 - Australia's Fishery Landings with Ex-Vessel Value, 1962/63 and 1963/64^{1/}

Species	1963/64			1962/63		
	Quantity		Value	Quantity		Value
	1,000 Lbs.	AL 1,000	US\$ 1,000	1,000 Lbs.	AL 1,000	US\$ 1,000
Finfish	87,373	6,580	14,608	80,589	6,146	13,644
Spiny lobster .	27,630	5,715	12,687	31,393	6,018	13,360
Shrimp	13,344	2,182	4,844	12,616	1,914	4,249
Crab	704	73	162	843	83	184
Oyster	13,094	1,232	2,735	13,030	1,122	2,491
Scallop	16,091	357	793	6,498	244	542
Other shellfish	2,634	174	386	1,016	39	87
Total	160,870	16,313	36,215	145,985	15,566	34,557

^{1/}Preliminary.

Notes: (1) Landed weights are shown. Total landings in table 2 are greater than the combined total landings in the individual states which do not include landings in the Northwest Territory.

(2) AL 1.00 equals US\$2.22.

pounds in 1963/64. There are also indications that the Australian catch of salmon (*Arripis trutta*) was up about 2 million pounds in 1963/64.

Scallops were landed in significant quantities in Victoria for the first time in 1963/64. During that period, the new Port Phillip Bay beds yielded 10,967,000 pounds of scallops with an ex-vessel value of A£200,000 (US\$444,000). That greatly outweighed a drop in scallop landings in Tasmania.

Australian shrimp landings in 1963/64 reached a record 13.3 million pounds due to heavier landings in western Australia.

A gain was also recorded for abalone as new markets were developed for that item. Spiny lobster landings, however, were down 12 percent from the previous year.

Exports: Australian exports of fishery products in 1963/64 were valued at A£8.3 million (\$18.4 million), an increase of about

12 percent from the previous year. The main reasons for the increase were improved prices for Australian spiny lobster tails in the United States, expansion of the scallop market in France, and an increase in frozen tuna exports to the United States.

Spiny lobster products make up the bulk of Australian fishery exports. Other export items are shrimp, scallops, abalone, and tuna. Pearls, pearl shell, whale products, and a small quantity of canned fish are also included in Australia's marine exports.

The main markets are the United States (for spiny lobster, tuna, and shrimp), France (for scallops and spiny lobster), and Japan (for shrimp, pearls, and pearl shell).

Table 3 - Australian Imports of Fishery Products, 1962/63 and 1963/64

Item	1963/64			1962/63		
	Quantity	Value		Quantity	Value	
	1,000 Lbs.	AL 1,000	US\$ 1,000	1,000 Lbs.	AL 1,000	US\$ 1,000
Frozen Products:						
Fish	37,989	4,583	10,174	32,579	3,564	7,912
Shrimp	1,656	489	1,086	723	213	473
Other shellfish	532	120	266	328	46	102
Canned Products:						
Fish	24,200	4,394	9,755	20,911	3,815	8,469
Shellfish . . .	887	290	644	619	224	497
Smoked and Dried Products						
Other products	8,522	956	2,122	8,945	835	1,854
	2,164	265	588	1,899	235	522
Total	75,950	11,097	24,635	66,004	8,932	19,829

Note: AL 1.00 equals US\$2.22.

Imports: Australian imports of fishery products in 1963/64 were up 15 percent in quantity and 24 percent in value from the previous year. Canned and frozen fish continue to be the main fishery import items. The bulk of the frozen fish imports are South African hake fillets, and British bream and

Australia (Contd.):

cod fillets packed in 1-pound and 5-pound cartons.

Domestic Consumption: Australian consumption of fishery products increased from 112 million pounds valued at A£9.7 million (\$21.5 million) in 1962/63 to 122 million pounds valued at A£11.0 million (\$24.4 million) in 1963/64. Imported frozen fillets accounted for a large part of the increase in domestic consumption. The demand for fish fillets is met by imports since the Australian fishing industry produces only small quantities of fish for filleting. It appears that a domestic fillet-processing industry could be developed with trawl fish from New South Wales and Victoria. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, Jan. 1965 p. 63, and Oct. 1964 p. 51.

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DEVELOPMENT OF SPINY LOBSTER INDUSTRY SPURRED BY FOREIGN DEMAND:

Australia's export of spiny lobster (tails and whole boiled) has for more than 10 years been the leading edible fishery export item. The Australian home market for that product is small and the spiny lobster industry, which has been established and developed as a result of constant overseas demand, is largely dependent on foreign markets.

The Australian spiny lobster industry has enjoyed a period of rising prices practically since it started--interrupted only for short periods, the most recent being in 1962/63. But in 1963/64 record wholesale prices of up to \$2.30 a pound were paid in the United States for Australian frozen spiny lobster tails.

Less dependence on the United States market has been a recent feature of Australia's overseas market for spiny lobster. France, which was a minor buyer five years ago, now imports nearly 2 million pounds of Australian spiny lobster tails and whole boiled spiny lobster a year. Canada, Belgium, Luxembourg, Italy, and Japan are also increasing their imports of Australian spiny lobster.

Despite this widening demand on world markets, the United States still remains, by far, Australia's best customer, taking about 80 percent of the total exports. Market con-

ditions in the United States have an important influence on the spiny lobster industry in Australia. The United States market is influenced by the level of inventories and the availability of supplies from local and other overseas sources. Both those factors suggest the high prices will continue. Inventories in the United States of spiny lobster tails were low early in 1965, and in September 1964 they were the lowest for 1964.



Fig. 1 - Two larger specimens of Australian spiny lobster.

While the market outlook for the Australian spiny lobster industry is generally satisfactory, the supply position is possibly less attractive. Leading fishing authorities have suggested that production from known Australian sources is probably approaching the optimum and that supplies for export have reached their peak. In Western Australia, in particular, the trend suggests there has been some reduction in the average size of spiny lobster produced. Midget sizes are becoming an increasing portion of the total harvested while medium and jumbo sizes are declining.

In other Australian States, although no details of grades are available, preliminary figures show that production in 1964 will be down from the previous year. The concern at production levels is reflected in a variety of management measures in force throughout Australia. Unexploited stocks still exist, particularly in the north, where the "painted" spiny lobster is known to exist.

Australia appears to have an assured market for all the spiny lobster it can produce.

Australia (Contd.):

High overseas demand should keep prices high but the main immediate problem could be maintaining supplies. The Australian spiny lobster industry has been developed on a tide of rising prices and increased catches. If the management measures to be undertaken are for any reason either too little or too late, some production decline may occur.

Australian spiny lobster fishermen use a number of methods for holding them aboard their vessels. Small vessels (18 to 35 feet), working inshore and returning to port or tying up each night, generally hold them in bags and unload them daily. Many of the small vessels used in Western Australia are built of marine plywood and have a "V" bottom. Those shallow-draft "scoota boats" are most popular and suitable for working around inshore reefs and in the shallow waters of the Abrolhos Islands area. Larger vessels, from 30 to 85 feet long, make trips of from 2 or 3 days up to 5 or 6 weeks and hold their catch in wet wells, open to the sea water, or in tanks with sea water pumped through them.

A number of processing vessels from 52 to over 100 feet long operate in Western Aus-

tralia. The catch is processed aboard and the tails are quick frozen in boxes of 25 pounds ready for export.

The beehive type pot is the most commonly used gear. A rectangular or "D" shaped trap is used on the New South Wales coast and a rectangular pot constructed of wooden battens is popular in the Geraldton and Abrolhos Islands area of Western Australia. Although the size and shape of the beehive pot does not vary greatly, materials used in its construction range from cane to cane and ti-tree, to steel frames covered with wire or synthetic netting.

Mechanical hauling winches, driven from the main engine or an auxiliary, are found on most vessels. The pot line is hauled over a roller on the rail, through a snatch block attached to a davit, or through a roller on a pot tipper which is hinged on the rail of the boat. The tipper is in a vertical position during hauling and when the pot comes up to it and trips a release, it tips inboard into a horizontal position with the pot sitting on top of it.

Synthetic pot lines have been introduced to the industry and may eventually replace natural fibers. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 61.

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SHRIMP FISHERY CONTINUES TO EXPAND:

Australia's modern shrimp fishery is a very recent development. Prior to 1947, Australian fishermen took shrimp only in estuaries and inshore waters. Then offshore shrimp grounds were discovered and explored off both the east and west coast of Australia. As a result, Australian shrimp landings nearly doubled between 1959 and 1964.

Efforts are now being made to develop new Australian shrimp fishing grounds. In 1964, a shrimp fishery was begun at Exmouth Gulf in Western Australia. In early 1965, an exploratory shrimp fishing survey was under way on the north coast in the Gulf of Carpentaria. The north coast survey is a joint project of the Commonwealth and the Queensland Governments.

Discovery of new shrimp grounds in the Gulf of Carpentaria, and in other areas off

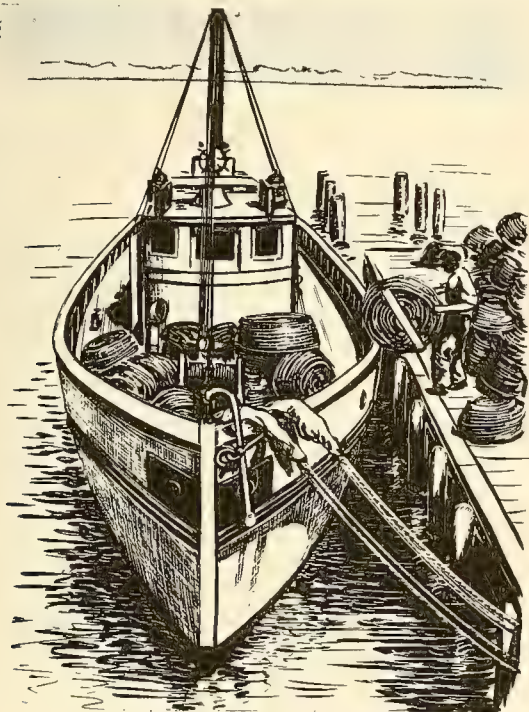
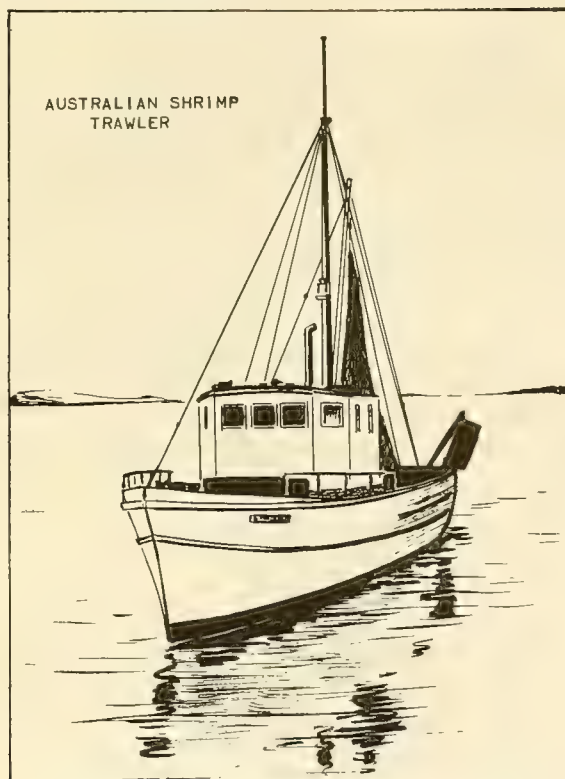


Fig. 2 - Australian spiny lobster boat taking on beehive-type pot.

Australia (Contd.):

northern Australia, could help relieve the pressure on existing grounds, but care in managing any new fisheries would be required to avoid excessive concentration of fishing effort.

Australian shrimp trawlers range in size from small launches used in the estuaries and bays to vessels of about 85 feet in length that work in offshore waters in depths of up to 150 fathoms. Most of the offshore shrimp vessels are powered by diesel engines and many are equipped with echo-sounders and radio transmitters.



On offshore shrimp vessels, the trawl is set and hauled from the stern of the vessel, the cod end being lifted over the side by the boom tackle and emptied on a sorting table or into a pound on the deck.

An overhead method of hauling the trawl warps is generally used in which the warps are led from the winch to blocks positioned above the winch drums and then to the gallow blocks, leaving headroom beneath the warps where they pass over the deck. (Australian Fisheries Newsletter, January 1965.)

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SCALLOP EXPORTS CONTINUE TO GROW:

Most of the scallops produced in Australia were absorbed by the domestic markets until fairly recently. But with the opening up of new beds in Victoria a growing export trade for them has been started.

Official Australian statistics do not record exports of scallops separately, but it is estimated that the quantities of scallop "meat" exported amounted to 23,400 pounds in 1961/62, 91,000 pounds in 1962/63, and 761,000 pounds in 1963/64. Exports to France during 1963/64 were 657,000 pounds or 86 percent of the total exports of scallop meats.

For the past 10 years up to 1962/63, Tasmania provided over 80 percent of Australia's scallop production, the remainder being produced by Queensland. The "in-shell" weight of scallops produced in Tasmania ranged from 3.8 million pounds in 1953/54 to 5.9 million pounds in 1962/63.

Recent growth in the newly established scallop fishery in Victoria, on beds in Port Phillip Bay, has greatly increased overall production. Preliminary data for 1963/64 show that Australian scallop production amounted to 15.4 million pounds (in-shell weight) valued at A£354,000 (US\$793,000), of which Victoria produced 10.9 million pounds, Tasmania 4.3 million pounds, and Queensland 170,000 pounds.

In Victoria, the commercial scallop (Pecten alba Tate) has yielded outstanding catches. Whereas the other scallop fisheries in Australia show definite seasonal trends, the Port Phillip fishery has been productive all year. Scallops have also been taken from the Shark Bay area of Western Australia, but full commercial exploitation of those grounds has not yet begun.

In Tasmania--the traditional scallop-producing State--commercial (Pecten meridio-nalis), dough boy (Mimachlamys asper-rim), and queen (Equichlamys bifrons) scallops are taken from D'Entrecasteaux Channel, and on the east coast of the island.

When shrimp trawling began in offshore waters near Yeppoon, Gladstone, and Bundaberg (Queensland), commercial catches of saucer scallops (Amusium ballotti) were made simultaneously. But the scallop fishery has not yet attained commercial importance because the shrimp fishery is more profitable.

Australia (Contd.):

It is, however, an important addition to Queensland's fisheries.

Scallops are taken by two methods in Australia--by otter trawl and dredges. In Queensland, shrimp trawlers are used with modified shrimp trawl net, and in Victoria and Tasmania a wide variety of vessels from 25 to over 50 feet long use the standard scallop dredge or the Baird type, which is commonly called the "sputnik" dredge. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 77; October 1964 p. 51; September 1964 p. 58.

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ABALONE FISHERY PROMISING:

Another fishery in Australia showing increasing commercial importance is for abalone. Export data for 1962/63 show that about 13,700 pounds of abalone (meat weight) was sold to Hong Kong. During the 1963/64 season an estimated 180,000 pounds valued at A£50,000 (\$112,000) was exported to Japan, and another 2,300 pounds was shipped to Hong Kong. A small market for abalone was also opened up in New Caledonia.

Market prospects are reported to be very favorable in Malaysia where there is considerable demand for the canned product. Potential markets also have been found in the United States where demand is best for canned abalone.

The abalone fishery has an interrupted history in Australia. Abalone (Haliotis spp.) is a marine gastropod or snail which inhabits rocky foreshores and reefs. The edible portion is regarded by many people, especially in Asia, as a delicacy. Little is known of the size of the abalone stocks, and some concern has been felt that Australian abalone might be depleted to the same extent as in California.

Abalone is taken in the Australian States of New South Wales, Victoria, and Tasmania, where a minimum size of 5 inches is in force. Abalone harvesting is done by shore-based divers and from small vessels of all types. SCUBA gear is generally used, and "hooka" gear has been tried from small boats. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, December 1964 p. 82

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QUEENSLAND FISHERY TRENDS, 1963/1964 SEASON:

Productive shrimp (king) fishing grounds were discovered by the shrimp trawling fleet out of Queensland, Australia, in 1964 as it extended its operations in deeper water than formerly fished.

The discovery of new unexploited shrimp grounds has stimulated the construction of larger vessels designed to remain at sea despite changes in weather, and to operate in waters as deep as 150 fathoms. In 1964, the construction of larger vessels increased by about 25 percent, and in 1965 at least 12 more large vessels are being built. One of them is 70 feet long.

Research is producing useful results in the shrimp and mullet fisheries largely as a result of close and continuing cooperation between the fisheries staffs of the Queensland and Commonwealth Governments. Such cooperation is also extended by the Commonwealth Scientific Industrial Research Organization (CSIRO).

The shrimp research unit, which has been working in the Gulf of Carpentaria since August 1963, is now planning an extension of its work to include studies of the East Coast shrimp stocks. Knowledge which has already been gained in the Gulf is expected to be of considerable value in furthering those studies.

Studies which were started several years ago into the mullet stocks of the Noosa Lakes have been stimulated by the assistance given by CSIRO and also by the advice given by an officer of the Food and Agriculture Organization's (FAO) Fisheries Division during his visit to Queensland in October 1964. The study, which is to be published, will be used in compiling a wider thesis on the mullet stocks of the Eastern Australian seaboard.

Tuna, which is known to be abundant offshore, where it is caught by long-lining, cannot at present be caught profitably by Australian vessels using that gear. Experiments in the south with a modified long line are being watched with interest and a survey is being planned to determine when and where tuna occur closer to the coast in shoals which feed at the surface and which can be caught by other and more profitable fishing methods than the long-line method.

A further development which will be of great value to the Queensland fishing fleet is

Australia (Contd.):

the provision of a harbor at Mooloolaba where moorings, a fish dock, and other facilities have been approved. Construction of those facilities is scheduled for this year. (Australian Fisheries Newsletter, January 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 76.

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FISHERY TRENDS IN SOUTH AUSTRALIA, 1953-64:

Fisheries production in the State of South Australia has more than doubled in the past 10 years. In 1953/54 it was 12.1 million pounds and in 1963/64 it climbed to 25.5 million pounds.

The establishment of a tuna industry has accounted for the substantial increase and, during the last 10 years tuna production has grown from only 6 short tons (1953/54) to 6,043 tons (1963/64).

While the tuna fishing industry has been developing in a spectacular fashion, that State's Director of Fisheries and Game said that aggregate production in other commercial fisheries is static notwithstanding fluctuations which may occur from year to year in production of certain species. The chance of developing new fisheries in inshore waters is not particularly encouraging, he said.

With the exception of tuna, little is known of the fisheries potential in offshore waters. Exploratory fishing in the Great Australian Bight would suggest that demersal fisheries are there, but who has the capital to risk another venture in those waters, he added. Therefore, in the immediate future, it would appear that development opportunities in offshore waters are dependent on tuna.

Provision of adequate port facilities for fishing fleets is said to be an acute problem. During recent years the South Australian Government has spent some A£500,000 (US\$1.1 million) on facilities for the special use of fishermen. Consideration is being given to lengthening docks in the southeast area, the building of a dock at Port Lincoln for the tuna fishing industry, shelter harbors at Ceduna and Port Adelaide, and a number of other projects.

Under the South Australian "Loans to Producers Act," funds continue to be available

both to fishermen and those at a secondary level in the industry. Those funds have assisted in the maintenance of the spiny lobster fishing industry and also have been a prime factor in the development of the South Australian tuna industry. (Australian Fisheries Newsletter, January 1965.)

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VICTORIA FISHERY TRENDS IN 1963/64 SEASON:

The development of fisheries out of Victoria, Australia, for scallops, striped tuna, and abalone were among the more notable achievements in that State's fishing industry in 1963/64, reported the Director of Fisheries and Wildlife at Victoria. That State's Fisheries and Wildlife Department together with the Underwater Explorers Group paved the way to the development of the scallop fishery by an underwater survey of Port Phillip Bay beds. This stimulated the interest of a few Tasmanian fishermen, who crossed Bass Strait to start commercial scallop fishing in September 1963. The fishery developed rapidly, and 90 boats dredged for scallops in the Bay in 1964 to supply local and export markets.

During 1963/64, the striped tuna fishery was developed, using monofilament nylon gill nets. The fishery operates from Lakes Entrance during the summer and autumn, and three boats supply a Melbourne fish cannery. The Victorian State Government provided funds to finance fishermen equipping boats for the striped tuna fishery.

Promising local and export possibilities are reported for the abalone fishery, which is operated by divers along the coast.

Port facilities in Victoria were improved at a number of important fishing centers. New slipways were built at Lakes Entrance, Queenscliff, and Port Fairy, and vessel harbors were improved at Port Welshpool, Portarlington, and Geelong. Harbors at Port Welshpool, Geelong, Port Fairy, Apollo Bay, and Portland were deepened by dredging.

Marine research programs are in progress in the scallop, black bream and King George whiting fisheries, and data are being collected for the Australian salmon (Arripis trutta) and southern spiny lobster programs of the Commonwealth Scientific and Industrial Research Organization (CSIRO).

Australia (Contd.):

Mussels, squid, and abalone were designated as fish for the purpose of the Fisheries Act so that catch and processing returns can be collected as a preliminary to research work on those species.

In the future it is anticipated that a blue-fin tuna fishery using live bait pole-fishing may be developed in Victorian waters. Also that trawler operations may be introduced with the aid of echo-sounding equipment to spot fish shoals. (Australian Fisheries News-letter, January 1965.)

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FISHERY TRENDS IN WESTERN AUSTRALIA, 1963/64 SEASON:

Spiny lobster fishing--the largest single fishing enterprise in Australia--and Western Australia's main fishery, continues to be a profitable and sound money earner.

In 1963 there were 2,526 fishermen engaged in spiny lobster fishing in Western Australia, and total production was 21 million pounds valued at A£4 million (US\$9 million).

At its peak in 1961/62, exports of spiny lobster and spiny lobster tails were valued at \$10.5 million, but due to a price drop in the United States market in 1962/63, exports dropped to \$8.9 million. In addition to tails, markets have been established for whole cooked spiny lobster. More shipments are now being made to France, Singapore, and Western Germany.

The Shark Bay shrimp fishery in Western Australia, which started in 1963, is said to be making satisfactory progress. Production in the first season was 1.2 million pounds of tiger and king shrimp, and this climbed to 2 million pounds in 1964. The fishery has extended to Exmouth Gulf, where "banana," as well as king and tiger shrimp are fished. Total production in the Gulf in 1963 was 39,000 pounds and in 1964 it was 36,000 pounds. There was a ready market for king and tiger shrimp, but banana shrimp were difficult to sell.

Humpback whaling has now stopped in Western Australia, in accordance with the decision of the International Whaling Commission. The two whaling companies there have now turned to sperm whaling. The Car-

narvon station will in the near future be transferred to Fremantle. The Albany company has obtained a third chaser vessel and substantially increased its take of sperm whales. There was a decided fall in the price of sperm oil on the world's markets in 1964.

Recent improvements at Western Australian fishing ports from public funds include: (1) A much enlarged fishing vessel harbor, with ancillary services, at Fremantle; (2) harbor and dock facilities for fishing vessels at Geraldton; (3) improved handling facilities at Shark Bay; (4) a jetty for use by fishermen at Port Denison (Dongara). In addition, privately-owned facilities have been installed at several places.

The Western Fisheries Research Committee has continued its work, and research on spiny lobster, shrimp, Australian salmon (Arripis trutta), and tuna is proceeding under the supervision of that committee. (Australian Fisheries Newsletter, January 1965.)



Brazil

U. S. AID FOR DEVELOPMENT OF FRESH-WATER FISHERIES:

The Alliance for Progress plans to help finance, with a contribution of \$60,000, the building of 16 reservoirs in Northeast Brazil for production of fresh-water fish. This is the result of the work done by the U. S. Bureau of Commercial Fisheries five-man mission to Brazil in 1964. The study was made in cooperation with the U. S. Agency for International Development (AID) and the Alliance for Progress.

In addition, AID has agreed to sponsor an investment survey on fishery resources in Brazil and Argentina. The survey is to be



Research raft used by Division of Hunting and Fishing, State of Sao Paulo, on Limerao Reservoir.

Brazil (Contd.):

done by a Tennessee fishery company which is interested in the production potential of a brackish water catfish reported to be plentiful in both Brazil and Argentina.

Note: See Commercial Fisheries Review, March 1965 p. 68.

**Burma****BIDS INVITED ON CANNED MACKEREL AND SAURY:**

The Burmese Government purchasing agency invited foreign firms to submit tenders on January 18, 1965, for 42,300 cases (can size not designated) of canned saury in tomato sauce (for February shipment) and 28,200 cases (1-lb. oval) of mackerel in tomato sauce (for March shipment). Japanese canned fishery products reported to be available for sale by the Japan Canned Sardine and Saury Sales Company include 36,000 cases (1-lb. tall) of canned saury in tomato sauce and approximately 110,000 cases of canned mackerel in tomato sauce, consisting of 50,000 cases of 1-lb. oval, 40,000 cases of 8-oz. oval, and about 16,000 cases of 5-oz. tall. (Suisan Tsushin, January 7, 1965.)

**Canada****OTTER TRAWLING IN CERTAIN "LOBSTER" WATERS OFF NEW BRUNSWICK BANNED:**

Otter-trawl fishing in the New Brunswick section of Passamaquoddy Bay at the southern end of the Bay of Fundy has been prohibited by the Canadian Fisheries Minister. The order was announced February 12, 1965, and became effective immediately. The restriction applies to "all waters north of a straight line drawn from Deadman Head to East Quoddy Head and all Canadian waters north of Campobello Island, including all waters of Passamaquoddy Bay in the Province of New Brunswick."

In that relatively small body of water, dragnets interfere excessively with other methods of fishing because of exceptional natural conditions. Lobster trap operators find it impossible to mark their gear adequately because the strong Passamaquoddy tides draw buoys under the surface and out

of sight except during the brief periods of slack water. Also, Passamaquoddy Bay is one of the few areas where lobsters inhabit grounds favorable for dragging. Lobsters usually prefer rough, rocky bottom which is unsuitable for trawl nets, but in Passamaquoddy Bay they exist on smooth bottom. As a result, trawl nets could have an adverse effect on lobster stocks. (Canadian Department of Fisheries, Ottawa, February 12, 1965.)

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BRITISH COLUMBIA FISHERY LANDINGS, 1964:

The value of fishery landings by British Columbia fishermen was the third highest in 1964 as compared with other years, according to the Department of Fisheries of Canada. The total landed value for all species in 1964 was C\$48.3 million as against \$49 million in 1962 and \$52.3 million in 1958. The value of salmon landings in those years is in the same order. In 1964 it was \$30.2 million; 1962, \$30.6 million; and \$37.1 million in 1958.

For the second year in a row, silver or coho salmon topped all other species in value, establishing new value and production records. Over 28.5 million pounds of silver salmon were landed in 1964 with an ex-vessel value of \$9.25 million. About 65 percent of the silver salmon landings was troll-caught. The 1964 sockeye catch of 22.9 million pounds had a value of \$8.25 million. The catch and ex-vessel value were slightly above the five-year average of 1959-63. The chinook or spring salmon catch with a record high was in third place. Landings of 12.1 million pounds were valued at \$5.5 million. The 1964 pink salmon landings totaled 36.5 million pounds with a value of \$4 million. The chum or fall salmon catch of 23.9 million pounds with a value of \$3.1 million was the highest since 1958.

British Columbia's 1964 halibut landings totaled 33.9 million pounds, the fourth largest landings on record. It was the highest percentage proportion (56.7 percent) of the total United States-Canada halibut catch ever taken by Canadian fishermen. Of the total catch, 8.2 million pounds were landed at United States ports by British Columbia vessels. The halibut ex-vessel value was \$8.3 million--second only to the record 1962 value of \$10.9 million.

The herring fishery in British Columbia recorded its second highest year of landings

Canada (Contd.):

in 1964 when 252,500 tons with a value of \$6.2 million were landed at British Columbia processing plants. Also reaching a new high in value in 1964 were crab landings worth \$700,000. The value of shrimp landings dropped off sharply to \$161,000, the lowest since 1959.

Oyster production in 1964 was down from the record high of 1963 but totaled 153,000 gallons of meats worth \$587,000. About 1.6 million pounds of clams were harvested in 1964 with a total value of \$59,000, the lowest since the recording of detailed statistics on clam production in 1951. Abalone production during the year was about 125,000 pounds valued at \$20,000.

Groundfish landings were generally good in 1964. About 12 million pounds of grey cod valued at \$722,000 were landed, setting a new production record. The previous high catch was the 7.7 million pounds in 1958. Lingcod landings totaled 3.8 million pounds valued at \$384,000. That species provides a stable fishery showing less fluctuation than any other. Landings of different species of sole (6 varieties are listed commercially) amounted to 6 million pounds valued at \$409,000. Less than a million pounds of ocean perch valued at \$36,000 were landed during the year.

Nearly a quarter of a million pounds of tuna valued at \$40,000 were landed in British Columbia in 1964. About 4.8 million pounds of industrial fish for use as animal feed were landed in 1964. (*Fisheries News*, Department of Fisheries, Canada, January 28, 1965.)

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FISHING VESSEL SUBSIDY EXTENDED:

In Canada, the 30 percent Government subsidy for the construction of fishing vessels 55 feet and over was extended to vessels in the 45- to 55-foot class. The maximum size of 99.9 gross tons remains the same. That change in the Fishing Vessel Assistance Regulations of the Federal Government was announced January 28, 1965. It is expected to speed the adoption of more versatile fishing craft, and give encouragement to fishermen in Canada's Atlantic Coast Provinces to acquire more efficient vessels.

In June 1964, the minimum size of Canadian vessels eligible for construction subsidies

from the Government was lowered to 35 feet, overall length, from the previous minimum of 45 feet. However, vessels under 45 feet are eligible for subsidy only when of an approved experimental design. Also, the subsidy which may be given to vessels of 35 to 44.9 feet is 25 percent of the cost approved by the Federal Minister of Fisheries, while the rate of 30 percent may now be paid for vessels from 45 feet in length overall up to the maximum of 99.9 gross tons. The subsidy is based upon the total approved cost of each vessel equipped and ready for fishing.

The Fishermen's Loan Boards in the Provinces of New Brunswick, Prince Edward Island, Nova Scotia, and Newfoundland, and the Minister of Industry and Commerce in the Province of Quebec are responsible for the direct administration of the subsidy regulations. Close control over the design and specifications of craft eligible for assistance is maintained by Federal-provincial cooperation. This will include consideration of the number of vessels to be built each year, and the coordination of vessel construction with training projects designed to provide skilled manpower for a modern Atlantic fleet. (Canadian Department of Fisheries, Ottawa, January 28, 1965.)

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VESSEL INSURANCE PLAN EXTENDED:

As an incentive to fishermen to invest in more efficient fishing vessels, the Canadian Federal Fisheries Minister has raised the upper limit on vessels which may be insured under the Fishermen's Indemnity Plan to C\$15,000. Previously the limit covered only vessels costing up to \$12,500. There is no change in the lower limit of \$250.

The Fishermen's Indemnity Plan of the Canadian Government came into operation in 1953. It offers fishermen owning and operating fishing vessels the opportunity to secure insurance against total or partial loss for an annual premium of 1 percent of the appraised value of the vessel. Because of the wide dispersion of small fishing vessels in many hundreds of fishing settlements, commercial marine insurance companies have found it impracticable to offer insurance to fishermen at rates within fishermen's capacity to pay.

Under the Government Plan, insured fishermen are compensated for total loss of a vessel at the rate of 60 percent of the value

Canada (Contd.):

in the Atlantic Provinces and 70 percent in British Columbia. There are also provisions for compensating partial losses. (Canadian Department of Fisheries, Ottawa, January 28, 1965.)

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OCTOBER 1965 PROCLAIMED AS "NATIONAL FISH 'N SEAFOOD MONTH":

Special recognition is to be given to the Canadian fishing industry and the resource on which it is built with a proclamation by the Canadian Fisheries Minister declaring October 1965 as "National Fish 'n Seafood Month."

The Minister's proclamation points to the important role Canada's extensive ocean and fresh-water fish resources have played in the discovery and development of Canada from coast to coast. It also emphasizes the valuable contribution the fishing industry makes to the livelihood of thousands of Canadians, and to the nutritional well-being of populations at home as well as those in the widely dispersed foreign markets to which Canadian fishery products flow.

Some 80,000 Canadian fishermen engage part or full time in the fisheries. The total landed value is as high as C\$125 million, and the market value of fishery products is about \$250 million. Aside from those directly engaged in the industry, many more thousands benefit from the subsidiary employment which the fisheries provide in the packaging, transportation, and other allied industries.

Canadian fishermen catch about 150 different species of fish and shellfish which are processed and marketed in a wide variety of products. These go to countries all over the world, making Canada one of the world's three leading exporters of fishery products.

New impetus was given to modernization of the Canadian fishing industry as a result of the National Fisheries Development Conference held in Ottawa in 1964 and rapid expansion is now taking place in construction of new fishing vessels, introduction of new fishing techniques, and improvement of fish-handling facilities.



Chile

FISHERIES TRENDS, FOURTH QUARTER 1964:

Chilean fish meal production in 1964 totaled 147,000 metric tons, an increase of 36 percent over the 108,000 tons produced in 1963. The increase in output would have been even greater if anchoveta had been more abundant in late 1964. (Editor's note: The movement of anchoveta beyond the limited range of the Chilean fishing fleet has been a recurrent problem for the Chilean fish meal industry.) In late November 1964, some of the purse seiners supplying the northern reduction factories began moving farther south into waters off Antofagasta Province in an effort to find anchoveta. Initially, Antofagasta fish canneries protested the "invasion" by the northern seiners, but the complaints seem to have subsided.



Fig. 1 - Crew of Chilean trawler (off of Valparaíso) lowering their net.

New reduction plants and facilities (recently completed, under construction, or planned) could give Chile a fish meal production capacity of over 400,000 tons in 1965. A larger anchoveta fishing fleet will be needed to supply the expanding industry. (In mid-1964, the Chilean anchoveta fleet numbered about 205 vessels, most of which were modern steel purse seiners of 100- to 170-ton hold capacity.)

The Iquique shipyard owned by a Chilean-United States firm has supplied many of the

Chile (Contd.):

vessels in the Chilean anchoveta fleet. In November 1964, the shipyard at Iquique laid the first keel of a new series of purse seiners (called the 82-I). The firm plans to produce four of the vessels each month and was expected to complete the first by March 1965.

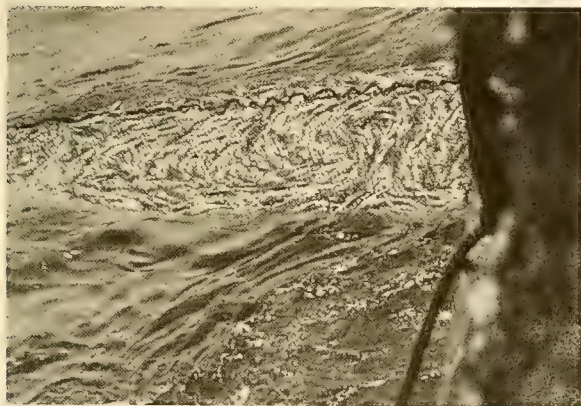


Fig. 2 - Cod end of trawl floating on the surface full of "merluza."

The Chilean fish reduction industry is centered in the northern Province of Tarapaca. Attention is now being given to developing fisheries in other Provinces of Chile. In late 1964, scientists from the Chilean Institute of Fisheries Development studied waters off southern Chile where there is little in the



Fig. 3 - Fishermen bringing their catch of tuna ashore from small tuna boats.

way of a fishing industry. The study off southern Chile was particularly concerned with shrimp and spiny lobster in waters near Talcahuano and Valdivia, and with hake and anchoveta near the latter port. Initial findings were said to be encouraging. The survey off southern Chile is related to the need to diversify the highly specialized fisheries of Chile.

Diversification may be aided by the plans of a Chilean firm to can 5,000 cases of "king" crab which is to be distributed by a United States firm. In addition, a Japanese group which was previously in Chile surveying crab resources has returned for further studies. Although neither the United States firm nor the Japanese interests has invested in the local industry, both continue to show an interest in the Chilean crab resource. (United States Embassy, Santiago, October 29, 1964, and January 22, 1965.)

* * * * *

THREE MORE JAPANESE WHALERS LICENSED TO FISH OFF CHILE:

By Decree 580 of October 29, 1964, the Chilean Ministry of Agriculture authorized 3 Japanese whaling vessels to take whales for a 3 year period within jurisdictional waters claimed by Chile. The Japanese vessels (Ryudo Maru, Ryudo Maru No. 5, and Seiho Maru No. 6) have a combined gross tonnage of 1,331 tons. The decree stipulated that the catch of the Japanese whalers must be landed at Chilean shore plants (sale at sea is prohibited).

Two other Japanese whalers had previously been granted 3-year licenses to operate within the 200-mile fishing limit claimed by Chile. The five Japanese whalers with Chilean licenses are all under contract to a Chilean processing firm based in Santiago, and all of the vessels have been furnished by one Japanese whaling company. (United States Embassy, Santiago, December 29, 1964.)

Note: See Commercial Fisheries Review, November 1964 p. 97; June 1964 p. 38.



Cuba

SOVIET AID TO FISHERIES:

The Chairman of the State Fisheries of the Soviet Union is reported to have made the following statement early in 1965 on Soviet aid to Cuban fisheries:

Cuba (Contd.):

In the summer of 1962, the first five Soviet medium-size trawlers arrived in Cuba. Cubans sailed on them with Soviet fishermen to learn the trade. The catch went to Cuba, and the Cuban Government purchased the trawlers to form the core of its new fishing fleet.

vicinity of Cuba and the Bahamas and also off the west coast of Florida and the Campeche Banks of Mexico. The Continental Shelf as well as deep areas are being studied. The expedition is scheduled to continue from May 1964 to May 1965. The Soviet research vessel Academician A. Kovalievski and several Cuban vessels are reported to be participating in the study. Object of the study is said to be a bet-



Now, says the Soviet fisheries Chairman, Cuba has a growing fishing fleet and 40 fishing cooperatives. Some 120 Cubans so far have been trained on Soviet vessels. Another 200 Cubans have been trained at the Soviet port of Kaliningrad and are working on the construction of Cuba's new fishing harbor at Havana. (Fishing News, London, January 29, 1965.)

OCEANOGRAPHIC STUDY IN GULF OF MEXICO AND SOUTH ATLANTIC CONDUCTED BY CUBAN-SOVIET EXPEDITION:

A Cuban-Soviet expedition is reported to be carrying out oceanographic studies in the

vicinity of Cuba and the Bahamas and also off the west coast of Florida and the Campeche Banks of Mexico. The Continental Shelf as well as deep areas are being studied. The expedition is scheduled to continue from May 1964 to May 1965. The Soviet research vessel Academician A. Kovalievski and several Cuban vessels are reported to be participating in the study. Object of the study is said to be a bet-



Denmark

FISHERIES TRENDS, 1964:

Denmark's fishery landings in local ports by Danish vessels in 1964 increased 2 percent from the previous year, according to prelimi-

Denmark (Contd.):



Fig. 1 - Fishing vessels docked in the Danish fishing port of Esbjerg.

nary data of the Danish Fisheries Ministry. An increase in the 1964 herring landings more than balanced the smaller landings of industrial fish, cod, and cod-like species. Pond trout production in 1964 was at a record high, as were landings of plaice, herring, and Norway lobster.

Table 1 - Danish Fishery Landings, 1964

Species	1/1964	1963
	. . . (Metric Tons) . .	
Landings in Denmark by Danish Vessels:		
Flatfish 2/	74,063	71,339
Cod	65,737	69,030
Cod-like 3/	58,544	64,072
Herring	360,625	290,872
Brisling	10,868	9,449
Mackerel	6,551	7,245
Eels	3,331	3,928
Salmon	1,371	2,386
Pond trout	8,460	7,804
Other fish 4/	241,746	293,585
Norway lobster	2,292	1,752
Deep-water shrimp	3,280	4,735
Other shellfish	60	138
Mussels	16,388	13,575
Starfish	3,447	1,769
Total	5/856,763	6/841,679
Landings in Denmark by foreign vessels	200,930	143,329
Grand total	1,057,693	985,008
Danish landings in foreign ports	4,290	12,016

1/Record annual total (preliminary).

2/Plaice, flounder, dab, common sole, etc.

3/Haddock, coalfish, hake, ling, etc.

4/Mostly industrial fish such as sand eels, Norway pout, etc.

5/Does not include Danish landings in foreign ports.

6/Includes 12,016 tons (about 60 percent) industrial fish landed in foreign ports by Danish vessels.

Source: Ministry of Fisheries.

Preliminary export data for 1964 show that larger quantities of fish and shellfish were produced as fresh, frozen, smoked, canned, and semipreserved products than in 1963. More fish was processed into fillets, and there was an increase in fish meal and oil production, but salted fish production was below 1963.

Table 2 - Danish Production of Processed Fishery Products, 1964

Product	Metric Tons
Canned:	
Herring and sprats	2,868
Mackerel	2,148
Other fish	4,196
Shellfish	994
Mussels	633
Total	10,839
Semipreserved:	
Herring and sprats	4,800
Other fish	382
Mussels	628
Total	5,810
Fresh and frozen fillets:	
Cod	20,873
Cod-like 1/	1,415
Plaice	18,556
Other flatfish	1,236
Herring	35,997
Other fish	163
Total	78,240
Smoked:	
Herring and sprats	2,001
Mackerel	1,808
Eels	705
Salmon and trout	514
Other	196
Total	5,224
Miscellaneous:	
Force meat 2/	1,708
Salted herring	127
Dry-salted cod	417
Other	1,279
Total	3,531
Industrial products:	
Fish meal	108,030
Fish oil	31,801
Fish solubles	11,829
Ensilage 3/	7,240
Total	158,900

1/Haddock, coalfish, hake, ling, etc.

2/Groundfish, milk and flour.

3/Chemically treated raw fish.

Source: Preliminary data from Ministry of Fisheries.

Based on 1963 data, the Fisheries Ministry estimates that about 85 to 90 percent of Denmark's fish meal and oil production is from whole raw fish and about 10 to 15 percent is from fish waste. On that basis, about 45,000 to 50,000 metric tons of fish were used for trout food, of which 90 percent was raw fish and 10 percent fish waste. About 120,000 to

Denmark (Contd.):



Fig. 2 - Danish fisherman standing on a typical live box or float in which live plaice are held for marketing in Fredrikshavn.

140,000 tons were used as food on fur-animal farms and for ensilage; about 75 percent (90,000 to 105,000 tons) was used on fur-animal farms. Of that amount, 60 to 75 percent (54,000 to 79,000 tons) was fish waste; 25 percent used for ensilage totaled some 30,000 to 35,000 tons. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 3, 1965.)

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AGAR-AGAR INDUSTRY, 1963:

Danish production of agar-agar in 1963 totaled 834 metric tons valued at 9.4 million kroner (US\$1.36 million), according to preliminary data. Total Danish exports of agar-agar in 1963 were 826 metric tons valued at 10.4 million kroner (\$1.5 million). The principal markets were West Germany with 291 tons, France 170 tons, the United States 31 tons, and Argentina 40 tons. (United States Embassy, Copenhagen, February 10, 1965.)



German Democratic Republic

REVIEW OF FISHING INDUSTRY AND PRODUCTION TARGETS:

The most important task facing East Germany's fishing industry is to become completely self-sufficient in its fishery production. That was the theme of an article in the East German publication *Neues Deutschland*, November 29, 1964, as published in a Norwegian fishery trade paper. The article reviews East Germany's fishing industry and plans for projected development to 1970. Included was detailed information on the investment and construction projects necessary to reach a total fishery production of about 400,000 metric tons in 1970, or about double the 1964 production. The production target set for 1964 was 182,500 tons. In December 1964 the same periodical reported that the 1964 production would be greater than the goal set and that it would for the first time exceed 200,000 tons of herring and other species. The same report stated that the production target for 1965 is 240,000 tons.

Reaching the planned goal in 1970 is based on developments so far. In 1950 the East German fishery catch totaled 26,600 tons and in 1963 it was 177,200 tons. In that same period canned fish production increased from 1,100 tons to 17,700 tons. While production goals in the original seven-year plan (1958-65) have been substantially met, consumption has not increased as planned. The consumption goal was 18 kilos (39.7 pounds) but was later reduced to 16.5 kilos (36.4 pounds) per capita in 1965. But the statistics show that consumption in 1963 was 13.7 kilos (30.2 pounds) as compared with 12.2 kilos (26.9 pounds) in 1955. This is an increase in total consumption from 219,000 tons in 1955 to not more than about 235,000 tons in 1963. The result may be seen in statistics for the East German imports of herring and fish which show total imports of 141,000 tons in 1955 and a decrease of almost 50 percent to 71,000 tons in 1963. Statistics for canned fish imports show a decrease of about 40 percent from 10,500 tons in 1955 to about 6,300 tons in 1963. In comparison, East Germany's total exports in that same period increased almost 100 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, January 27, 1965.)



Ghana

FISHING INDUSTRY FAVORED BY CERTAIN TAX EXEMPTIONS:

The Government of Ghana allows "pioneer company" status to fish canners, ice manufacturers, and fish meal manufacturers. This status originally consisted of exemption from tax on profits for five years, but now the tax exemption may continue until the initial capital has been fully recovered.

Exemption from customs duties also is allowed on fish hooks, fish nets, and netting, and on the importation of all kinds of fish, except fish that is preserved only by chilling or freezing. Imported fish in that category carries a 10 percent ad valorem duty.

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FISHERY RESEARCH CENTERED ON BIOLOGY OF SARDINE:

A long-range marine biological investigation was begun in Ghana in mid-1962 under the technical assistance of the Food and Agriculture Organization (FAO). This research program has two main objectives: (1) a study of the biology of the sardine (*Sardinella aurita*) with special regard to bionomics and composition of stocks, and (2) a study of the composition of demersal fish stocks and the effects of fishing operations on those stocks.

Sardines account for about 60 percent of the total annual fishery catch of Ghana, and demonstrates the importance of that species in the fisheries of the nation. Studies were started on the biology and movements of the sardine, using the research vessel *Kokote* of the Fisheries Station at Tema. Studies are also being made on the decline of the fishery for the "apapa" (*Caranx hippos*), a jack species, important in the Ghanaian fisheries.



Iceland

EX-VESSEL FISH PRICES SET FOR 1965:

A 5.5 percent increase in ex-vessel prices for groundfish caught on line and hooks in 1965 was announced January 12, 1965, by Iceland's Fish Pricing Board. Prices are based on dockside delivery to the purchaser.

Following are selected 1965 Icelandic ex-vessel prices for hook and line landings of first grade groundfish, gutted and heads-on:

Species	Price	
	IKr./Kilo	U.S.\$/Lb.
Halibut:		
2-20 kilos (4.4-44 lbs.)	9.50	10.03
Over 20 kilos (44 lbs.)	12.86	13.58
Cod:		
Large--over 57 cm. (22 in.)	4.09	4.32
Haddock:		
Large--over 50 cm. (20 in.)	4.38	4.63
Ling:		
Large--over 72 cm. (28 in.)	3.23	3.41

For each species, ex-vessel prices range lower for smaller fish and fish of less than first grade. The price of third-grade cod and haddock for reduction is Kr. 0.84 a kilo (0.9 U. S. cents a pound). The price of ocean perch for reduction is Kr. 0.95 a kilo (1.0 U.S. cents a pound), while the price of ocean perch suitable for freezing is Kr. 3.34 a kilo (3.53 U.S. cents a pound).

The 1965 prices were set by the Government representative on a special 5-man arbitration committee. Both the arbitration committee and the full Fish Pricing Board were deadlocked when the Government representative intervened.

As part of the settlement of the price issue, the Government agreed to ask the Icelandic Parliament to provide a subsidy of Kr. 0.25 a kilo (0.26 U. S. cents a pound) for groundfish landings. (United States Embassy, Reykjavik, February 3, 1965.)

Note: Icelandic Kronur 43.0 equal US\$1.00.



Italy

SICILY EXPANDS ATLANTIC FISHING FLEET:

In November 1964, the new fishing vessel *Giovanni Primo* sailed from Palermo, Sicily, on her maiden fishing venture in Northwest African waters near the Canary Islands. The 149-ton refrigerated vessel was built in Italy at a cost of about 150 million lire (US\$242,000), and is equipped with modern navigational and sounding instruments. The *Giovanni Primo* joins the growing number of Sicilian fishing vessels which since late 1962 have been fishing in the Atlantic off the northwest African coast.

Developments in the last 2 years emphasize the tendency for Sicilian fishermen to switch from the Mediterranean Sea to the more fruitful Atlantic Ocean. In May 1963, a businessman from Northern Italy established two firms

Italy (Contd.):

in Palermo to engage in Atlantic tuna fishing. Both firms were authorized in 1964 to increase their working capital to 100 million lire (\$160,000). One firm plans the construction of four 900-ton fishing vessels, and the other firm plans four 1,500-ton fishing vessels. The new vessels are to be built in Italy and registered in Palermo by the end of 1966.



One of the new tuna firms is believed to have the participation of a Japanese fishing company which is said to have invested 30 million yen (\$83,330), or more than half of the firm's capital. The Japanese firm will probably conduct the Sicilian firm's tuna fishing operations for at least the first couple of years.

Other fishing firms with plans for Atlantic fishing were established in Sicily during the last 2 years with the expectation of aid from the Sicilian Government. However, the Regional Government appears to be doing little to help the Sicilian fishing industry, and several of the new firms now appear to

have financial problems. (United States Consul, Palermo, December 16, 1964.)

Note: See *Commercial Fisheries Review*, December 1964 p. 96; October 1964 p. 59.



Japan

ATLANTIC TUNA FISHING TRENDS AND EXPORT PRICES, FEBRUARY 1965:

Japanese tuna catches in the Atlantic Ocean in early February 1965 consisted largely of albacore and yellowfin tuna, with albacore running 20 to 30 percent more than yellowfin in the catches. But because of the lower albacore tuna price on the United States market, Japanese tuna vessels fishing for that species are said to be gradually shifting to yellowfin.

Prices for Atlantic-caught albacore (frozen round) exported to the United States as of February 1965 were quoted at US\$275-280 a short ton f.o.b. West African port, the same as at the close of 1964. Sales were reported slow due to lack of buying interest among United States tuna packers.

Prices for Atlantic yellowfin (frozen dressed) exported to Italy were reported steady at about US\$425 a metric ton c.i.f. Indications of more claims because of dark meat in the yellowfin tuna shipped to that country were reported. (Suisan Keizai Shim-bun, February 16; Suisan Tsushin, February 9, 1965.)

EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO U. S., JANUARY-DECEMBER 1963-64:

Japan's export validations of frozen tuna and frozen tuna loins to the United States in December 1964 totaled 5,113 short tons. Of that total, 59.6 percent were albacore tuna, 18.6 percent yellowfin, 1.0 percent big-eyed, 8.8 percent skipjack, and 12.0 percent tuna loins.

During January-December 1964, Japan's export approvals amounted to 109,593 short tons, an increase of 28,749 tons or 35.7 percent as compared with 80,744 tons exported during the same period in 1963. On a species basis, albacore exports in 1964 were up 61.9 percent, yellowfin 13.4 percent, big-eyed 14.6

Japan (Contd.):

Japan's Export Validations of Frozen Tuna and Tuna Loins to U. S., January-December 1964 with Comparisons									
Species	December 1964			January-December 1964			January-December 1963		
	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total	Direct	Trans-shipped	Total
(Short Tons)									
Albacore, round	933	2,114	3,047	25,284	34,213	59,497	13,610	23,127	36,737
<u>Yellowfin:</u>									
Round	-	385	385	-	1,920	1,920	-	962	962
Gilled and gutted: 20/100 lbs.	252	121	373	25,543	4,131	29,674	21,568	4,269	25,837
100 lbs. up	27	-	27	2,408	-	2,408	1,675	-	1,675
Dressed with tail	-	163	163	87	4,700	4,787	-	4,438	4,438
Filletts	5	-	5	38	12	50	326	132	458
Total	284	669	953	28,076	10,763	38,839	23,569	9,801	33,370
<u>Big-eyed:</u>									
Gilled and gutted	-	3	3	30	42	72	24	4	28
Dressed with tail	-	49	49	-	250	250	-	240	240
Filletts	-	-	-	37	3	40	7	41	48
Total	-	52	52	67	295	362	31	285	316
Bluefin, fillets	-	-	-	-	1	1	-	374	374
Skipjack, round	-	450	450	8	3,585	3,593	70	3,693	3,763
<u>Loins:</u>									
Albacore	522	-	522	3,805	-	3,805	2,998	-	2,998
Yellowfin	89	-	89	3,496	-	3,496	3,029	-	3,029
Bluefin	-	-	-	-	-	-	157	-	157
Total	611	-	611	7,301	-	7,301	6,184	-	6,184
Grand Total	1,828	3,285	5,113	60,736	48,857	109,593	43,464	37,280	80,744

Source: Japan Frozen Food Exporters Association.

percent, and tuna loins 18.0 percent, but skipjack was down 4.5 percent. (Fisheries Attache, United States Embassy, Tokyo, January 25, 1965.)

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NEW DEVELOPMENTS ON SUSPENSION OF CANNED TUNA EXPORTS TO UNITED STATES:

Difficulties surrounding the conclusion of a workable arrangement between the Japanese tuna packers and exporters are said to be hampering the resumption of Japanese canned tuna in brine exports to the United States, which have been suspended since December 1964. Following the expiration on November 30, 1964, of the 1964 Exporters Agreement,

the Japan Canned Foods Exporters Association has been unable to develop a new export agreement acceptable to the Tuna Packers Association, thus precluding sales transactions between packers and exporters.

A series of meetings has been held in recent weeks by Japanese packers and exporters to find ways and means whereby they could transact business in the absence of an export agreement. At a meeting held on February 8, 1965, the Packers Association adopted a provisional sales plan whereby it would offer for sale 290,000 cases of tuna packed in brine to exporters for shipment in February. On February 9, the Exporters Association held a meeting to deliberate on the packers' proposal, and after much debate, voted to accept it.

Japan (Contd.):

On February 10, the Exporters Association filed an application with the Ministry of International Trade and Industry (MITI) for an export license. However, MITI, which on February 5 had developed a provisional standard governing approval of quota allocations to exporters for the period ending February 28, 1965, asserted that the Export Trade Control Law precludes approval of export quotas not calculated on the basis of a definite allocation standard, and thus is reported to have refused to license the export of the 290,000 cases agreed to by the packers and exporters. The firm attitude of MITI has created another obstacle to be overcome before sales can be consummated between packers and exporters who now fear this development may further delay canned tuna exports to the United States for sale during the Lenten season. (Suisan Tsushin, February 8, 10, 15; Suisan-cho Nippo, February 13, 1965, and other sources.)

Note: See Commercial Fisheries Review, March 1965 p. 79.

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JAPAN TO ASK SOVIETS FOR 120,000-TON SALMON CATCH QUOTA FOR 1965 SEASON IN WESTERN PACIFIC:

Japanese and Soviet negotiators expected to meet March 1, 1965, in Tokyo, Japan, to set salmon and king crab catch quotas for 1965 in western Pacific waters regulated by the International Northwest Pacific Fisheries Commission. (Treaty waters north of 45° N. latitude are designated Area A; those south of 45° N. latitude are designated Area B). Japanese views on the negotiations were summarized in the Japanese periodical Tokyo Shim-bun, January 19, 1965, as follows:

(1) The Japanese Government, with industry support, will insist on a Japanese salmon catch quota in 1965 for Areas A and B combined of 120,000 metric tons (the same as in 1963, but up 10,000 tons from 1964). In support of their position the Japanese cite the theory of alternating lean and good salmon seasons which indicates 1965 will be a good year.

(2) The Soviets are expected to insist that salmon resources are declining. The Soviets will cite the poor Japanese salmon catch during 1964 in Area B which was 20 percent under the allowable 55,000-ton quota.

(3) The Soviet position on king crab fishing cannot be predicted because new factors have arisen such as the United States-Japanese agreement on king crab fishing in the eastern Bering Sea. In 1964, the northwest Pacific king crab production quota was set at 630,000 cases of 48 6.5-oz. cans (252,000 cases for Japan and 378,000 cases for the Soviet Union).

(4) An important factor in the background of the negotiations is that the Japan-Soviet fishery agreement is scheduled to be revised next year. In last year's negotiations, the 10 percent allowance above or below the quota permitted in Area B was deleted from the appendix to the fishery agreement. It is expected that in this year's negotiations, the Soviet side will again insist on stronger control measures, such as the entry into Area B of Soviet inspection vessels.

The Japanese were expected to insist that 1965 fishery negotiations be conducted separately from the proposed revision of the fishery agreement. (United States Embassy, Tokyo, January 25, 1965.)

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VESSEL DECREASE PLANNED IN BONITO-TUNA FISHING FLEET:

Japan's catch of bonito and tuna has been showing a downward curve since 1962. Because of that, the Japanese fishing industry has started to study a plan to reduce the number of bonito and tuna fishing vessels by 20 to 30 percent from the present number of vessels.

According to a survey made by the Japanese Fisheries Agency, bonito and tuna catches showed an upward trend, with 546,000 metric tons in 1960, 651,000 tons in 1961, and 724,000 tons in 1962. Following the peak in 1962, the catch started declining due to a decrease in the resource, and also due to keen competition. The catch in 1963 was 690,000 tons and in 1964 it was estimated to be between 670,000 and 680,000 tons. On the other hand the vessel tonnage for that fishery has shown an increase with a total of 250,000 tons in 1961, 274,000 tons in 1962, and 306,000 tons in 1963. As a result, the catch per vessel has declined in the past 1 or 2 years.

Further, the sale to South Korea by Japan of 11 tuna vessels has recently been approved. Those vessels were to start fishing for bonito

Japan (Contd.):

and tuna in the South Pacific about the spring of 1965. As a result, competition in fishing for those species will be even greater. (San-kei, February 12, 1965, United States Embassy, Tokyo.)

Note: See Commercial Fisheries Review, September 1964 p. 82.

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CANNED SHRIMP EXPORTS, 1964:

Japan's exports of canned shrimp for the 12 months of 1964 totaled 547,497 cases (converted to 24 1/2-lb. cans) valued at US\$3.4 million. This was a decrease of 119,580 cases or 17.9 percent below the previous year's exports and the value was down 4.4 percent.

Japan's canned shrimp exports to the United States during the year were much lower--168,910 cases valued at \$976,973 or down 57.3 percent in quantity and 51.6 percent in value as compared with the 1963 exports. The lower exports to the United States were attributed to unfavorable market conditions in 1963 stemming from a large United States Gulf of Mexico canned shrimp pack and low prices.

Canned shrimp exports to Great Britain in 1964 were more than double (up 108.4 percent)

those in 1963 and the value increased proportionally (up 154.8 percent), but exports to other countries were lower. (Fisheries Attache, United States Embassy, Tokyo, February 17, 1965.)

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TRAWLING IN GULF OF ALASKA
LICENSED IN 1965:

The Japanese Fisheries Agency stated in early February 1965 that Japanese vessels would be licensed for trawling during 1965 in the Gulf of Alaska as far east as 135° W. longitude in an area north of 50° N. latitude. Japanese licenses for Gulf of Alaska trawling are to be issued to 20 trawlers (2 or 3 additional licenses may be approved later). The Japanese Fisheries Agency authorized 4 trawlers to enter the Gulf of Alaska fishery during February-May 1965. The remaining 16 trawlers are scheduled to enter in June and later months. Following are the names of the first group of trawlers with gross tonnage and scheduled entry into the Gulf of Alaska:

Takachiko Maru (3,490 gross tons) mid-February 1965.

No. 82 Taiyo Maru (2,800 gross tons) early March 1965.

Japan's Exports of Canned Shrimp, by Country of Destination, 1964

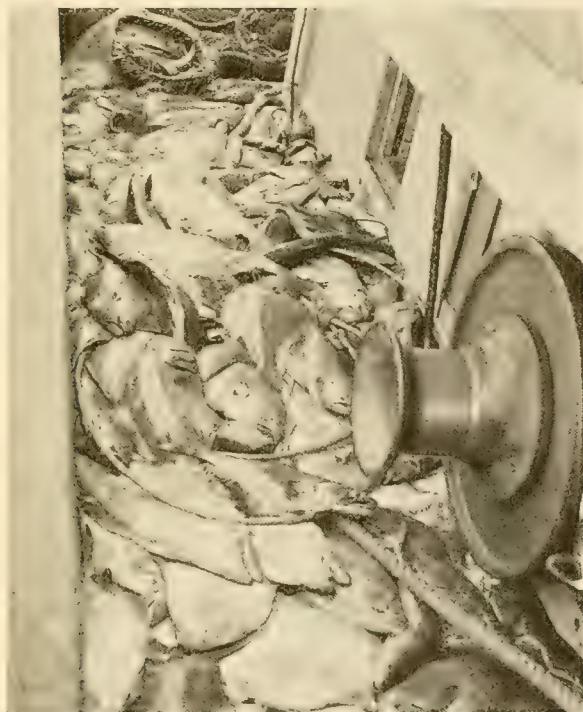
No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases)							
24 1-lb.	Small	-	100	-	-	1,970	2,070
24 1/2-lb.	"	44,631	112,002	5,136	10,285	6,756	178,810
24 1/4-lb.	"	2,130	15,943	-	-	-	18,073
48 1/4-lb.	"	250	5	-	500	120	875
24 1-lb.	Tiny	-	100	-	-	899	999
24 1/2-lb.	"	40,274	49,630	1,000	7,070	12,644	110,618
24 1/4-lb.	"	6,574	24,583	-	1,100	799	33,056
48 1/4-lb.	"	-	32,930	-	-	4	32,934
24 1-lb.	Broken	-	100	-	-	899	999
24 1/2-lb.	"	77,323	11,300	56,472	-	4,508	149,603
24 1/4-lb.	"	2,262	40,930	-	-	241	43,433
48 1/4-lb.	"	949	11,937	-	-	25	12,911
24 1/4-lb.	Mixed	-	12,658	-	-	-	12,658
. (Converted to Standard Cases of 24 1/2-lb. cans).							
Total 1964		168,910	265,461	62,608	18,405	32,113	547,497
Target for 1964		165,000	230,000	65,000	20,000	20,000	500,000
Total 1963		395,157	127,388	71,244	41,493	31,795	667,077
Value in US\$ 1964		976,973	1,750,893	335,611	115,880	195,331	3,374,688
Value in US\$ 1963		2,018,561	687,175	386,911	267,011	170,200	3,531,858

Source: Japan Canned Crab Sales Co. (Sales agent for canned shrimp).

Japan (Contd.):

No. 53 Akebono Maru (1,490 gross tons)
early March 1965.

No. 12 Daishin Maru (2,900 gross tons)
late May 1965.



Catch on the deck of a Japanese trawler operating in the Bering Sea and North Pacific.

The Japanese Fisheries Agency has stated that necessary regulatory measures will be issued for the Gulf of Alaska trawl fishery, including those needed to implement international agreements. (United States Embassy, Tokyo, February 4, 1965.)

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JAPANESE VIEWS ON ANTARCTIC WHALING SEASON QUOTA:

The outlook of the three Japanese whaling companies participating in the 19th Antarctic Whaling Expedition is not very promising, according to an article translated from the Japanese periodical Nihon Keizai, January 11, 1965. The reasons given are: (1) whale resources are decreasing throughout the world, especially in the Antarctic; (2) most nations affiliated with the International Whaling Com-

mission (made up of 17 fishing countries) are showing a mounting tendency toward reducing the total catch quota. . . . Depending on the progress of the proposed new whaling conference and the 17th Annual Meeting of the International Whaling Commission to be held at London in June 1965, it is expected that Japan's current seven-fleet whaling operation numbering three companies will be affected by a decision on reducing the number of vessels.

The whaling operations of the three Japanese whaling companies have consisted of 7 fleets since the 15th whaling expedition (1960/1961 season), with one company having 3 fleets and the other 2 companies each having 2 fleets. The total catch by the 7 fleets amounted to 5,980 blue-whale units (an average of 854 per fleet) in the 15th expedition, 6,574 (939 per fleet) in the 16th expedition, 6,150 (878 per fleet) in the 17th expedition, 4,600 (657 per fleet) in the 18th expedition, and a quota of 4,160 blue-whale units (594 per fleet) in the 19th expedition. It can be seen that the whale catches have been gradually decreasing, with that of the 16th expedition as the peak catch.

The Japanese whaling companies say that although operating expenses differ in each fleet according to depreciation, about 600 units is the minimum to meet expenses. The catches in the present expedition have already fallen below that figure. For the 7 fleets to carry out whaling operations in the future, a catch of at least about 4,160 blue-whale units, as in the 19th expedition, is considered necessary.



Whale catcher boat alongside Japanese factoryship to receive supplies and fuel.

At the Annual Meeting of the International Whaling Commission held in June 1964, the

Japan (Contd.):

United States, which is among the nonwhaling nations, proposed that the annual quota for the three whaling nations (Japan, the Soviet Union, and Norway) be 4,000 units in the 19th expedition, 3,000 in the 20th, and 2,000 in the 21st. As a result, that proposal was not adopted because of the opposition by the whaling nations, and also the opposition of former whaling nations such as the Netherlands and United Kingdom, and it was decided after consultation among the whaling nations that the quota for the 19th expedition would be 8,000 blue-whale units.

This is the first time in whaling history that the catch quota has not been officially decided upon at the annual meeting, although an agreement was reached through consultation among the whaling nations....

Against the tendency of reducing the Antarctic whale catch quota, the Japanese have filled the gap by purchasing whaling mother-ships from Norway, Great Britain, and the Netherlands with the whaling rights attached. But as it is felt that most foreign idle vessels with whaling rights have already been purchased, the Japanese Fisheries Agency also considers that steps for maintaining 7 Japanese whaling fleets by purchasing foreign motherships should no longer be taken.

As a result, one of the Japanese whaling companies is beginning to make a full-scale study of a plan to keep one of the present two fleets inactive. That company is considering plans such as the scrapping of motherships, reassignment of auxiliary catcher boats to whaling at the South Georgia Island base, and reassignment of auxiliary catcher boats to whaling at the South Georgia Island base, and reassignment of crew members.

The other 2 companies, on the other hand, have no intention of decreasing their vessels at present, and have not abandoned the idea of purchasing idle Norwegian motherships to maintain their present fleet organization. (Nihon Keizai, January 11, 1965, United States Embassy, Tokyo.)

JOINT FISHING ENTERPRISES
WITH FOREIGN COUNTRIES:

Joint fishing enterprises between Japanese firms and foreign fishing firms cover a wide

range of operations including fishing for tuna and tuna canning, trawling, whaling, cold-storage bases, fish meal production, and pearl culture.

The Japan Fishery Agency has listed a total of 31 Japanese overseas fishing ventures, 30 of which were active as of January 1965. In addition, 10 Japanese firms are performing services for the pearl industry of Australia, Burma, Thailand, Malaysia, and the Philippines.

Japanese companies have 12 bases in operation in Central and South American countries (Venezuela, Brazil, Argentina, British Bahamas, Guatemala, Peru, Netherlands Antilles); 10 bases in Asia and Oceania areas (India, Ceylon, Malaysia, Burma, Ryukyu Islands, New Hebrides, Hong Kong, Fiji Islands); 4 bases in Africa (Ivory Coast, Nigeria, Madagascar; Las Palmas, Canary Islands); 2 bases in Europe (Portugal and Italy); 1 base in Israel; 1 base each in the United States and Canada. Some of the bases were established as early as 1953 and more recently in 1964. (Fisheries Attache, United States Embassy, Tokyo, January 29, 1965.)

FISHING VESSEL LICENSES IN
EFFECT DECEMBER 31, 1964:

The worldwide range of Japanese fisheries is indicated by a recent summary of vessel li-



Fig. 1 - Wooden trawler with gear in water fishing for mothership in Bering Sea.



Fig. 2 - Japanese factoryship freezing shrimp and Pacific ocean perch in Bering Sea.

Japan (Contd.):

Vessels Licensed for Major Fisheries by Japanese Fishery Agency, as of December 31, 1964						
Fishery	Vessel Tonnage Limits	Total Vessels Licensed	Area of Operation	Principal Species in Fishery	License Period	License Expiration
	Tons	Number			Years	Date
Tuna fishery, other than mothership: High seas	Over 50	1,329	Pacific, Indian, and Atlantic Oceans	Bonito, tuna, marlin, swordfish, shark	5	8/31/67
Near seas	Under 50	1/1,850	Pacific Ocean--North of 10° N. latitude and west of 160° E. longitude			
Tuna fishery, mothership: Motherships	Over 500	45	Pacific, Indian, and Atlantic Oceans			
Catcher vessels	Less than 20	119	Pacific Ocean--north of equator and east of 170° W. longitude; south of equator and east of 170° E. longitude.			
Motherships	3,000	3				
Catcher vessels	Over 50	165				
Salmon fishery, other than mothership	Over 30	283	North Pacific Ocean	Salmon	1	3/31/65
Salmon fishery, other than mothership	Over 10	369	North Pacific Ocean--south of 45° N. latitude			
Salmon fishery, mother- ship: Motherships	Over 5,000	11	North Pacific Ocean			
Catcher vessels	Over 50	369				
Crab fishery: Motherships	Over 2,000	4	West Kamchatka	King crab	1	12/31/65
Catcher vessels	Over 50	16				
Hanasaki vessels	Over 20					
Motherships	Over 2,000	3	Bering Sea	King crab	1	12/31/64
Catcher vessels	Over 50	13				
Hanasaki vessels	Over 20	27				
Trawling, other than mothership	Over 15	1,147	Offshore areas near Japan (east of 128°, 40° E. longitude)	Halibut, cod, Atka mackerel, Zuai crab	5	7/31/67
	15-550	785	East China Sea-Yellow Sea (west of 130° E. longitude)	Croaker, seabream, halibut, flounder	5	8/31/67
	15-3,000	201	Bering Sea, Africa, New Zealand	Cod, rockfish, seabream, cuttlefish, squid, octopus, croaker, shrimp, lobster		
Trawling, mothership: Motherships	1,400	14	Bering Sea	Halibut, flounder, cod, croaker	1	1/31/65
Catcher vessels	50-500	228				
Long line and gill net	100-463	19	Bering Sea	Cod, croaker	5	8/31/67
Purse-seine (large and medium)	Over 40	734	North Pacific, Japan Sea, East China Sea, and Yellow Sea	Sardine, horse mackerel, mackerel, tuna	5	10/31/67
Whaling, coastal: For large whales	Less than 450	22	Off coast of Japan	Baleen whales (excluding minke whales), sperm whales	5	11/30/67
For small whales	Less than 40	19	Off coast of Japan	Mink whales, toothed whales	5	10/31/69
Whaling, mothership: Motherships	10,000	7	Antarctic	Baleen and sperm whales	5	10/11/66
Catcher vessels	300	91				
Motherships	10,000	3	North Pacific			
Catcher vessels	300	21				

1/Entry into fishery not yet approved.
Source: Japanese Fishery Agency.

Japan (Contd.)

censes issued by the Japanese Fishery Agency. (Fisheries Attache, United States Embassy, Tokyo, December 23, 1964.)



Malaysia

JOINT FISHING VENTURE
WITH JAPAN PLANNED:

A joint Japanese-Malaysian fishing venture was proposed during a visit to Southeast Asia in early 1965 by a 29-man Japanese trading mission from Kochi Prefecture. The Mission spent two days in Kuala Lumpur where it met with the Malaysian Assistant Minister of Commerce and Industry, and members of various Chambers of Commerce and manufacturers to discuss and investigate local trade conditions. Details of the proposed joint venture are expected to be worked out in the near future.

Under the proposed venture, the Kochi Prefecture fishing fleet would fish in the Indian Ocean and in Malaysian waters. The Prefecture would offer to the Malaysian Government scholarships on marine and fisheries. The Japanese further expressed their willingness to send to Malaysia experts on trawler fishing to help the Malaysian Fisheries Department. It is expected that a group of Japanese businessmen connected with small industries will visit Kuala Lumpur during summer 1965 for discussions on working out fishery and other joint ventures. The leader of the Japanese Mission stated that their visit had revealed tremendous potentialities in Malaysia for foreign businessmen to set up joint ventures. (United States Embassy, Kuala Lumpur, January 26, 1965.)

Note: See Commercial Fisheries Review, February 1964 p. 76.)



Mexico

SHRIMP CATCH ON WEST COAST
POOR DURING 1964/65 SEASON:

Because of poor catches since the Mexican West Coast shrimp fishing season started in September 1964, at least 300 shrimp vessels operating out of Guaymas in the State of Sonora, Mexico, discontinued fishing as of mid-February 1965. The shrimp catch there

has so far been at least 20 percent less than at the same time last season and the vessel operators are reported as having no intention of resuming fishing this season. The lower income to the vessel operators and fishermen combined with State and Federal taxes precludes any further operation of the vessels.

Probably the most restrictive condition imposed on the fishing industry has resulted from the terms of the contracts between the vessel owners and the cooperatives, the members of which comprise the crews. The contracts provide that the vessel owners receive 55 percent of the income while the 45-percent balance goes to the cooperatives. During a good or average season, the owners report they can operate adequately with that income-splitting ratio, even though the cooperatives bear only about 37 percent of the operating costs. But during a poor season such as the present one, both the owners and the cooperatives operate at a disadvantage although the owners claim they bear the greatest burden. The contracts are due to be renegotiated in September 1965 and in all likelihood the owners will use this season's (1964-65) difficulties as a lever in their attempts to lower the percentage received by the cooperatives, or to raise the proportionate level of the expenses assumed by the cooperatives.

Appeals have been made to the Governor of the State of Sonora to reduce state-imposed taxes. He has also been asked to intervene on behalf of the shrimp industry with federal authorities to reduce federal taxes. So far no action has been taken on reducing such taxes. Relations between the vessel owners and the cooperatives are cordial and they appear to be working together in their efforts to find a temporary solution to some of their problems.

Reports from other sections of the shrimp fishing industry confirm that all other Mexican West Coast shrimp ports share the same problem. Fishing has been poor ever since the season opened, all the way from the Gulf of California to the Guatemala border. Although the open season runs until May 1965, everyone is said to be discouraged. But for the higher shrimp prices, the poor fishing during the present season would have resulted in a much worse situation.

Unlike the 1963/64 season when vessel owners and cooperatives were in bitter disagreement, all now realize that they share a mutually difficult position and must work together.

Mexico (Contd.):

Improvement in the present economic condition of most of the cooperatives is being considered in high government levels. (Fishes Attache, United States Embassy, Mexico, February 17, 1965.)



Nigeria

U. S. FIRMS PLAN AFRICAN FISHING VENTURES:

At least four United States groups are interested in commercial fishing off Nigeria on the African Atlantic Coast. Two separate U. S. firms were in Nigeria early in 1965 carrying out shrimp fishing surveys. (Shrimp off Nigeria are of the *Penaeus duorarum* species and correspond to Gulf of Mexico pink shrimp, according to a marine biologist with the Food and Agriculture Organization.)

Following is a summary of the plans of four U. S. groups involved in Nigerian fishing projects:

(1) Two 70-foot shrimp trawlers belonging to a U. S. businessman completed a 10-day trial fishing run off Nigeria on January 20, 1965. During the trial run, the 2 trawlers each made about 17 drags of from 45 minutes to 4 hours duration. Area covered by the vessels was from Lagos to east of the Bonny River mouth. Each vessel's catch--which was exploratory and not representative of a typical commercial load--amounted to about 1,000 pounds of heads-off shrimp and 5,000 to 6,000 pounds of mixed fish. Size of shrimp averaged 21-25 count a pound heads-off. The best catches were in depths of from 10-20 fathoms; there was little difference between day or night fishing.

The U. S. businessman who conducted the shrimp survey in January is backed by a New York fisheries firm and he is associated with an Iraqi concern with Nigerian interests. He plans to bring to Nigeria 4 additional trawlers of up to 80 feet in length. Shrimp grading and freezing equipment is to be installed on the vessels. Their catch would then be processed at sea and brought to Lagos for transshipment to the United States. Until the processing equipment is installed, catches will be sold to a Nigerian cooperative at Apapa for local distribution.

(2) Another U. S. businessman arrived in Nigeria on January 10, 1965, to conduct a 2-month shrimp survey under an investment survey grant from the U. S. Agency for International Development (AID). He brought in several 20- to 30-foot nets specially designed for heavy mud bottoms, such as are common off the Niger River delta. The nets will be rigged aboard a 50-foot trawler loaned by the Nigerian Government. The survey will be carried out along the entire Nigerian coast. Special attention will be given to the area off Calabar. If the survey proves the feasibility of a large-scale operation, U. S. interests propose to establish a Nigerian shore base (packing, freezing, and cold-storage plants) which would involve an investment of between US\$3 to 4 million over a 2-year period. Calabar or the Port Harcourt area have been mentioned as possible locations for the base.

If it develops as planned, the project could employ 50 steel shrimp trawlers, some of which might be built locally. Twenty shrimp vessel captains would be brought in to train Nigerian crews.

Pioneer status for the venture may be granted by the Nigerian Government, which would clear the way for production to begin within 6 months. Full production could be reached within a year.

Capacity of the operation as planned would be about 5 million pounds of frozen shrimp annually. Talks have been held with a shipping company to determine if it has adequate refrigerated vessels to haul 200,000 pounds of frozen shrimp every 2 weeks from Nigeria to the United States. Assurances were given that this could be done, but the initial freight rate quoted (7 U.S. cents a pound) might cause problems.

(3) Other U. S. groups are known to be planning fishing ventures in Nigeria. A large U.S. company in Gloucester, Mass., will shortly undertake an AID investment survey in Nigeria. If feasible, the company will undertake a sea-food processing operation in Nigeria involving an investment of up to \$1.5 million, excluding fishing vessels.

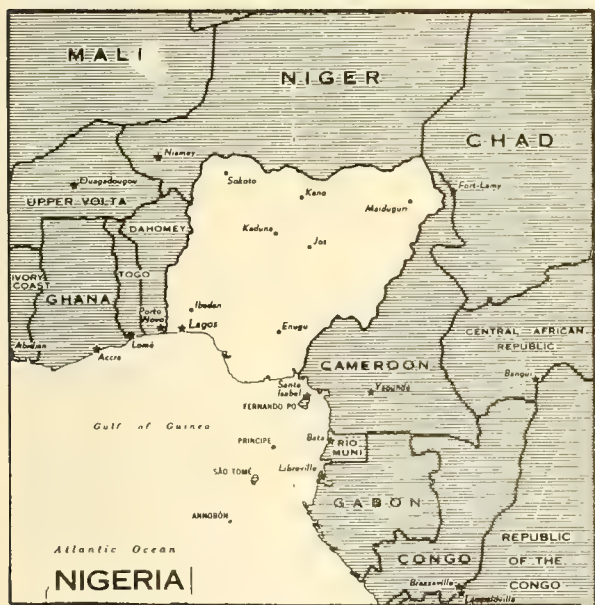
(4) A New York firm announced on December 20, 1964, in the New York Times the conclusion of an agreement to invest \$24 million during the next 10 years in a fishing complex in Western Nigeria. (United States Embassy, Lagos, January 29, 1965.)

* * * * *

Nigeria (Contd.):

EXTENDED SURVEY TO BE MADE OF SHRIMP RESOURCES:

A shrimp trawling survey of Nigerian coastal waters was to be started about February 1, 1965, by the Federal Fisheries Service of Nigeria. The survey, to be carried out by the research vessel *Kiara*, will extend over a one-year period covering 2 rainy seasons and 2 dry seasons, and will cover the Continental Shelf out to a 100-meter (328-foot) depth. Transects will be about 15 miles apart, 6 stations to be made on each transect. The survey is designed to provide more detailed information for Nigerian waters to supplement that obtained from the Guinean trawling Survey conducted by the Commission for Technical Co-operation in Africa (CCTA) for the coast of the Gulf of Guinea from Dakar to Pointe Noire. (Results of the Guinean Trawling Survey are expected to be published late in 1965.)



The results of this survey of Nigerian shrimp resources will be of interest to the several United States and Nigerian companies now participating or concerned with the development of a shrimp industry in Nigeria. (Regional Fishery Attache, United States Embassy, Abidjan, January 27, 1965.)

Note: See *Commercial Fisheries Review*, September 1964 p. 86; August 1964 p. 1.

TWO SHRIMP TRAWLERS ORDERED FROM JAPAN:

Two shrimp trawlers were ordered from a Japanese shipyard by a Nigerian fishery

company at Lagos. The trawlers are expected to be delivered about July 1965 and will fish in Nigerian waters under Japanese captains and engineers, but probably with Nigerian crews. One of Japan's largest fishing companies has agreed to buy all of the shrimp production from the two new vessels for the first five years of the operation. Packing and freezing of the shrimp will be done at the Lagos plant.

This is another indication of the rapidly growing interest in the shrimp resources of Nigeria which are being actively investigated by United States firms. (Regional Fisheries Attache, United States Embassy, Abidjan, January 27, 1965.)

**North Korea****DUTCH-BUILT FREEZER FISH-FACTORY VESSEL DELIVERED TO NORTH KOREA:**

A new freezer fish-factory vessel of 7,000 deadweight tons built by a Netherlands shipyard in Rotterdam was reported to have been delivered to a North Korean firm in Pyongyang on January 30, 1965.

Daily freezing capacity of the new vessel is 100 metric tons in vertical-plate freezers and 20 tons in a freezing tunnel. Cold-storage capacity of the vessel is 7,500 cubic meters (about 265,000 cubic feet). The vessel is powered by a diesel engine of 6,000 horsepower. (United States Embassy, The Hague, February 5, 1965.)

Note: See *Commercial Fisheries Review*, November 1964 p. 98; April 1964 p. 76.

**Norway****EXPORTS OF CANNED FISH, JANUARY 1-OCTOBER 31, 1964:**

Norway's total exports of canned fish during January 1-October 31, 1964, were up about 6 percent from those in the same period of 1963, due mainly to larger shipments of canned brisling and canned soft herring roe. There was a slight decline in exports of canned small sild sardines.

The packing of sild sardines in 1964 started in early May and by November 21, 1964, a total of 662,206 standard cases of small sild had been packed, compared with 679,717 cases in the same period of 1963. Most of that pack

Norway (Contd.):

was smoked sild. Unsmoked sild accounted for only 48,659 cases of the 1964 pack and 49,044 cases of the 1963 pack.

Norwegian Exports of Canned Fish		
Product	1/ Jan. 1-Oct. 31, 1964	Jan. 1-Nov. 2, 1963
	. . . . (MetricTons). . . .	
Brisling	5,402	4,575
Small sild	11,937	12,225
Kipperd herring	2,740	2,625
Soft herring roe	1,089	672
Sild delicatessen	410	405
Shellfish	1,443	1,321
Other fishery products	2,610	2,422
Total	25,631	24,245
1/ Preliminary.		

As usual, the brisling canning season closed October 15. The 1964 brisling pack totaled 377,801 standard cases, compared with 282,039 cases in 1963.

Mackerel landings in 1964 for canning purposes totaled 1,722 tons as of November 14, 1964, compared with 1,577 tons in the same period of 1963.

For January to August 1964, Norwegian total canned fishery exports of 19,400 tons were valued at Kr. 98 million (US\$13.7 million), compared with 17,400 tons valued at Kr. 88 million (\$12.3 million) in January-August 1963.

The United States was the main market for Norwegian exports of canned fishery products in January-August 1964 with 6,495 tons valued at Kr. 35.2 million (\$4.9 million), followed by the United Kingdom with 5,397 tons valued at Kr. 29.4 million (\$4.1 million). Other markets were the South Africa Republic with 1,160 tons, Czechoslovakia with 1,089 tons, Australia with 1,021 tons, and Canada with 568 tons. With the exception of sales to the United States, canned fish deliveries to all major markets in January-August 1964 were running ahead of the same period in 1963. Shipments to the United Kingdom were up 1,317 tons and Kr. 8 million (\$1.1 million). The decline in shipments to the United States was 270 tons in quantity and Kr. 2.7 million (\$378,000) in value. (Norwegian Cannery Export Journal, December 1964.)

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FISHERY TRADE WITH
EAST GERMANY, 1964 AND 1965:

According to press reports, Norwegian firms plan fishery exports to East Germany in 1965 totaling about Kr. 31 million (US\$4.3 million), which would be about the same as in 1964. The 1965 fishery exports to East Germany are to include: fresh and processed fish valued at Kr. 15 million (Kr. 16.5 million in 1964); fish meal Kr. 10 million (Kr. 8 million in 1964); canned fish Kr. 5 million (same as in 1964); and sperm oil Kr. 850,000 (Kr. 1.8 million in 1964).

Fishing vessels are included on a list of items which Norway may import from East Germany. (United States Embassy, Oslo, December 16, 1964.)

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GENERAL AGREEMENT ON GOVERNMENT
SUPPORT TO FISHERIES APPROVED:

The General Agreement on government support to Norway's fisheries was approved June 3, 1964, by a unanimous vote of the Norwegian Storting. The agreement establishes that the fishermen's union, "Norges Fiskarlag," shall act as the sole representative of the fishermen in negotiations with the Government on state support and other measures to increase the income of fishermen. Previously, such negotiations have taken place between the Government and the various marketing organizations of the fishermen.

The General Agreement comprises general rules concerning the negotiations, the statistical basic material to be used, the conditions necessary to demand negotiations to be opened, the framework of the support measures, etc. The agreement further contains specific rules for the negotiations to take place during the first five years. These rules comprise modernization measures to increase the profitability of the fisheries, as well as social measures to be carried through during the period covered. (United States Embassy, Oslo, January 18, 1965.)

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EARLY RESULTS OF 1964/65
ANTARCTIC WHALING SEASON:

The Norwegian whaling fleet produced only 14,195 barrels of whale oil and 21,315 barrels of sperm oil during the first 15 days of operations in the 1964/65 Antarctic whaling exped-

Norway (Contd.):

ition, reported the Norwegian Whaling Association. This compares with 27,405 barrels and 20,592 barrels, respectively, as against the first 17 days of the 1963/64 season.



Norwegian whale catcher boat used in Antarctic.

It is conjectured that the Norwegians will probably not catch their quota of whales for the 1964/65 season. (United States Embassy, Oslo, January 18, 1965.)



Pakistan

FAO EXPERT FINDS GREAT SCHOOLS OF CATFISH IN GANGES DELTA AREA:

Prime quality catfish that feed on rice have been found in East Pakistan in mile-wide schools over fishing grounds practically untouched by hook or net. The discovery was reported by an Icelandic master fisherman with the Food and Agriculture Organization (FAO) who recently completed a 3-year assignment in Pakistan. He found immense catfish schools in the Shahbazpur River of Pakistan while conducting exploratory fishing from a 72-foot vessel. "We had an echosounder on board and at first I couldn't believe the readings," he said. "The whole river bottom seemed to be alive with fish."

At one point, using a bottom trawl, the FAO expert and his Pakistani companions caught 5 tons of catfish in a short period of minutes. The team fished the Shahbazpur off and on from April through November 1964 and caught an average of 677 pounds of catfish an hour. The team averaged 618 pounds an hour during April, 741 pounds in May, and 1,902 pounds in November. The catfish caught

ranged from 1 to 43 pounds in weight. In East Pakistan and neighboring east India the fish is known as "pangas."

"The good thing is that the Shahbazpur 'pangas' feeds on rice floating down the river. This makes its meat particularly clean and tasty," the FAO expert said. The rice comes from paddies along two of Asia's great rivers, the Ganges and the Brahmaputra. During June, July, and August the southwest monsoon hits the foothills of the Himalayas and causes one of world's heaviest rainfalls. The Brahmaputra floods then and covers the rice fields. Millions of rice grains are washed into the rivers.

The rice floats downstream and flows into the Shahbazpur and other rivers of the Ganges Delta where it gathers in underwater gullies and pits, and attracts the rice-eating fish in great numbers. In December 1964, a Pakistani commercial fishing vessel, the M.F.V. Sayera, was guided to the Shahbazpur where it caught 27,480 pounds of catfish in 3 hours and 20 minutes of trawling.

The FAO master fisherman says he has no doubt that these grounds, all but untouched by commercial trawling operation, could supply several thousand tons per year of top-quality catfish to protein-hungry areas of East Pakistan. "The East Pakistanis and their nearby Indian neighbors already like catfish," he said. "It is one of the most popular local fish. I've never seen finer catfish than those that feed on rice in the Ganges Delta." (Food and Agriculture Organization, Rome.)



Peru

ANCHOVY POPULATION PRESENTLY SHOWS NO SIGN OF DEPLETION:

The explosive growth of the anchovy (Engraulis ringens) fishery off the coasts of Peru and Chile has caused concern regarding the status of that resource. In 1963, over 7 million metric tons of anchovy were landed in the two countries, and it is estimated that the catch was even greater in 1964. Recent studies carried out by the Marine Resources Research Institute in Peru have shown no indication of overfishing to date. Experience in the anchovy fishery, however, at high levels of production has not extended over a sufficient number of years to enable an authoritative de-

Peru (Contd.):

termination of the maximum sustainable anchovy yield.



Portugal

1964 SARDINE FISHING SEASON
REPORTED ONE OF BEST:

Portugal's 1964 sardine fishing season closed January 15, 1965, with reports that the catch was one of the largest and most profitable in several years. Complete data for the 1964 sardine catch are not yet available.

According to press reports from Oporto, the port of Matosinhos continues to be the largest sardine fishing center in Portugal. Some 120 fishing vessels operated out of that port during the 1964 season. The new sardine fishing season is scheduled to open on April 16, 1965. (United States Embassy, Lisbon, January 30, 1965.)



Rumania

TWO LARGE STERN TRAWLERS
FISH OFF NORTHWEST AFRICA:

Rumania's two stern trawlers, the Costanta and the Galati, started fishing off the northwest coast of Africa in January 1965. Up until that time they had fished in the Norwegian Sea near the Faroe Islands.

Both vessels have a displacement of 3,600 gross tons, are over 280 feet long, and have a speed of 13.7 knots. They are considered the largest stern trawlers in the world. They can trawl at the bottom or in midwater, have a freezer holding capacity of 58,269 cubic feet and a fish-meal holding capacity of 18,187 cubic feet. Each vessel carries two 20-gross-ton boats for purse-seining and long-lining.

Rumania's first two deep-sea fishing trawlers were ordered from a Japanese shipyard at Hitachi in October 1962, at a cost of US\$2.8 million for each vessel. The terms were a 30 percent down payment and the balance payable in semiannual installments over a period of 5 years. The vessels were delivered in the spring of 1964.

Under the terms of purchase, fishing trials could not be conducted in Japanese waters. The Costanta (with 20 Japanese instructors aboard) went on its maiden voyage to New Zealand, while the Galati fished with the Soviet ocean perch expedition in the Western Aleutians. In New Zealand's western waters, the estimated catch of the Costanta was about 80 tons a day, and the largest haul was 15-20 tons in 2 hours' trawling time.

Unlike other East European countries, Rumania planned her high-seas fishery development independently. After consulting with British and Western German shipbuilding architects, the Rumanians draw up their own trawler design and then contracted with Japan to build the vessels.

In late 1964, the fishery ties between Japan and Rumania were further strengthened with the conclusion of long-term contracts for delivery by Japan of large quantities of frozen mackerel.

Note: See Commercial Fisheries Review, July 1964 p. 55; March 1964 p. 67.



Uganda

COMMERCIAL FISHERY BEING DEVELOPED:

With its 13,600 square miles of major lakes and many rivers and small lakes, Uganda, Africa, has a very considerable potential for the development of a commercial fishing industry. Actual commercial fishing only started in 1910 when gill nets were imported for use on Lake Victoria. Prior to that, fishing was on a subsistence basis involving hooks, spears, basket traps, and similar locally-made devices. Records of early commercial catches are sketchy but it is known that until 1927 only the Lake Victoria fishery was developed to any extent and then primarily, for only one kind of fish, Tilapia esculenta (locally called ngege).

The potential importance of the lake fisheries was recognized by surveys between 1927 and 1931. The recommendations based on the surveys resulted in the creation of a Fisheries Section of the Game Department in 1931. It became a separate department in 1961 responsible for developing and controlling the fisheries. Its headquarters is in Entebbe on Lake Victoria and it maintains a 30-acre fish farm at Kajansi and has officers in the various fishing areas. Its aim is to obtain the maximum sustainable yield of fish to supply both home and export markets.

Many waters which naturally did not contain fish of commercial value were stocked with tilapia. The best example of those early plantings of fish are those of the Koki lakes and Lake Nakivalli which were stocked in 1935 and now regularly produce 2,000 tons of Tilapia nilotica a year.

PRODUCTION AREAS: The main producing areas in Uganda are Lakes Victoria, Edward, George, Albert, and Kyoga, where gill-netting, beach-seining, basket-trapping, and long-lining are the methods most commonly used. Ngege (Tilapia) is still the main econom-

Uganda (Contd.):

ic species but many other species of fish find a ready sale including Nile perch, catfish, lungfish, elephant-snout fish, and the sardine-sized *Haplochromis*. The crocodile trapping industry produces a few thousand skins each year for overseas and local markets.

Lake	Area	1961		1951		
		Quantity	Value	Quantity		
	Sq. Miles	Metric Tons	£ US\$	Metric Tons		
Victoria	10,961	23,000	1,150,000	3,220,000	10,000	
George	104	10,451	418,040	1,171,000	5,622	
Edward	235	12,866	402,500	1,127,000	2,500	
Kyoga	880	10,000	300,000	840,000	4,000	
Albert/Albert Nile Lake Nakivalli Complex	1,385	1,935	77,400	217,000	1,200	
Other lakes, dams, rivers and fish ponds	57	1,936	58,080	162,000	500	
Total	73	13,695	60,188	2,406,020	6,737,000	23,822

The fisheries are almost entirely African-run and 20,000 Africans find employment in the catching and distribution segments of the industry.

PRODUCTION AND CONSUMPTION: In 1962, Uganda's fishery production totaled 63,500 metric tons with a landed value of £2.5 million (US\$7 million) and a value at the retail level of \$9.8 million. Uganda's exports in 1961 of processed fish from the western lakes to the Congo Republic dropped by 400 tons in quantity and £100,000 (US\$280,000) in value as compared with 1960, due in part to difficulties in arranging currency exchange. Many fishermen have now turned their attention to markets in Uganda and there has been a steady increase in sales of fish produced on Lake Albert to Lango, Acholi and West Nile districts. Smoked fish processed from fish caught in Lakes George and Edward sold to Kampala and other markets in Buganda has eliminated the importation of fish from Tanganyika which was formerly imported by Uganda in large quantities. Elsewhere unsettled political and economic conditions in East Africa have impeded Uganda's expansion of fishery products sales, especially for fish fillets, which are sold mainly to the immigrant communities. Competition of supplies of frozen and cured sea fish and foods from overseas sources have also had their effect on Uganda's export potential. At the end of 1961 the most severe floods on the lakes of this country affected fishing and caused fishermen to evacuate their lakeside villages, necessitated covering the seining beaches, hindered the drying of fish, and disrupted communications. Local sales of fish were also severely affected because lake levels in some cases were more than 11 feet above average and resulted in fish spreading far inland in low areas

Item	1961			1951
	Quantity Metric Tons	Value £ US\$		Quantity Metric Tons
Salted and smoked fish	2,350	293,585	822,000	3,137
Frozen fillets	333	91,000	255,000	-
Fish meal	157	5,535	15,000	-
Crocodile skins	1/	28,000	78,000	1/
Total	2,840	418,120	1,170,000	3,137

1/ Data not given.

to the extent that farmers were fishing in their own backyards.

Annual consumption of fish in Uganda now averages 18.6 pounds per capita as compared with 25 pounds in the United Kingdom. But there are wide variations between districts; the Batoro still eat very little fish because of local prejudices whereas surveys show that the Acholi in the Gulu area now eat over 50 pounds per capita a year. The prejudices against fish eating which previously affected Kigezi, Ankole, and Bunyoro are breaking down rapidly.

MARKETING AND PROCESSING: In general, marketing is done by itinerant fish dealers of whom some 7,000 were licensed in 1961. Although the majority still deliver their fish by bicycle, an increasing number are using motorcycles, truck, or rail transportation. In the Lake George-Edward region, marketing is a commercialized operation and there are two modern fish-processing plants. One of the plants is at Kasenyi on Lake George and is equipped with blast and plate-freezers, salting vats, and a fish-meal plant. The second plant is at Katunguru on the Kazinga Channel which has similar facilities. Both plants supply fresh and quick-frozen fish by rail and road to markets throughout East Africa and salt-cured fish to the Congo, and also to local markets. African processors at Katwe on Lake Edward have invested considerable sums in permanent salting vats and hot-smoking pits. At the end of 1961, a third fish-freezing plant for the area was built at Kabatoro near Lake Edward to produce whole frozen fish for sale through the company's own retail-wholesale fish shop in Kampala.

Many improvements in the marketing segment of the fishing industry have taken place in the last three years by the building of warehouses and the installation of basic services at major landing points, and also by improvements to road communications to the lakes. The improvements have resulted in the processing of fish under more sanitary conditions and its transport in sizable quantities from the lake-shore to the major markets. In 1961 a new fish market at Mases in Jinja was opened and the good facilities there were used to advantage by both fishermen and fish dealers. At Katwe on Lake Edward a start was made on the installation of a piped water supply to both the residential area and the fish-curing establishments. Plans were approved and funds were voted for the construction of a fish market at Soroti and for dried fish stores in Teso and West Nile. A new all-weather road connecting Ntoroko to Fort Portal was built in 1962 to open up the fishing industry at the south end of Lake Albert.

VESSEL CONSTRUCTION: There are about 5,800 licensed fishing canoes in Uganda. The Fisheries Department has encouraged the use of powered canoes to increase their range and there are now some 1,400 canoes with outboard engines, the remainder being hand-propelled. The Uganda Credit and Savings Bank provides loan facilities to reliable fishermen for fishing gear, vessels, curing facilities, and transportation.

Instructions in vessel building are given at Masindi Technical School. Students who have completed the course either set up their own boatyard or join one that is already established.

FISHERIES RESEARCH: There has been a considerable program of fisheries research in Uganda which

Uganda (Contd.):

has mainly been carried out by the East African Fresh-Water Fisheries Organization at its headquarters and laboratory in Jinja. Since its establishment in 1948, that organization has published considerable information on the biology and ecology of fish and of the general hydrology and productivity of the lakes.

Since 1957, the Food and Agriculture Organization (FAO) has had some of its officers assist the Uganda Fisheries Department in studying specific problems. The FAO staff consists of a statistician, 3 fisheries biologists, an economist, and a fish-processing expert.



A U. S. marine biologist, assigned by FAO in 1958 to Uganda, worked with a team of assistants provided by the Government of Uganda to evaluate the fishery resources of Lake George. Pulling in gill net used to sample the lake's fish resources.

Preliminary experiments were carried out on Lake Victoria on the catching and canning of Engraulicypris which process much more easily than Haplochromis, and which are plentiful in the Entebbe area.

FISH STOCKING: Uganda has over 700 dams built for cattle watering and in 1961 fish stocking continued in those and other waters. Some 1,000 Tilapia nilotica were planted in Lake Victoria at Entebbe. Nile perch were transferred to dams at Nyapea in West Nile and at Kawanda Research Station. In Lake Kyoga, where Nile perch were first planted in 1954, catches of that species were made regularly in all areas, the largest specimens claimed to be over 100 pounds in weight. In Lake Victoria, Nile perch were first reported there in 1960 and were believed to have originated from Lake Kyoga. More of them were later seen in commercial catches indicating that those fish had bred. All were in the Jinja area and the largest fish weighed 11 pounds.

FISH FARMING: Fish farming which now makes use of the weed-eating Tilapia zillii has made rapid progress since the Kajansi Fish Farm was established in 1953. By 1961, the number of ponds had increased from 7,153 to 7,593. It is estimated that only about 10 percent of the total potential catch of one million pounds of fish from those ponds is being realized. Work has been centered on persuading the farmers to feed their fish regularly with sweet potato tops and to weed out surplus fry. About 10 percent of the farmers are now maintaining and exploiting their ponds and stocks properly. Commercial fishing of dams stocked

in previous years with Tilapia from the Kajansi Fish Farm have gathered momentum and in 1961 a number of dams in Ankole, Mubende, and Masaka districts produced between 5 and 50 tons each. At Kajansi, work is being concentrated on breeding carp (Cyprinus carpio). Excellent results were achieved and not only were breeding stocks supplied to a number of selected African farmers and ponds at institutions but a small quantity also were frozen for sale in Kampala and Nairobi. The frozen carp found a good market acceptance and the demand became greater than supplies.

Since 1959 considerable financial and material aid has been given by the United Nations International Children's Emergency Fund (UNICEF) to the Uganda Fisheries Department for the establishment of fish ponds at schools in Bukedi district and for the general improvement of fisheries. In 1961 the Bukedi Plan made good progress and large fish ponds were completed at five schools and all standing water stocked with fish.

SPORT FISHING: Uganda provides good sport fishing and local interest in angling is encouraged by the Uganda Angling Association. Black bass, which were stocked by the Fisheries Department in Lake Mutanda in 1960, bred during 1961 and became well established. There were indications that breeding had also taken place near Fort Portal in Lake Saka which was stocked with black bass at the same time. (Fisheries Department, Government of Uganda.)

Note: See Commercial Fisheries Review, August 1963 p. 109.



Uruguay

FUR SEAL INDUSTRY:

Several coastal islands off Uruguay (Isla de Lobos near Punta del Este and four smaller islands off the Cabo Polonio) are the home of extensive fur seal herds. The herds consist of two-coated seals ("dos pelos") and one-coated seals ("un pelo"). The Uruguayan Government agency in charge of commercial fishing and oceanographic research (SOYP) has a complete monopoly over harvesting the fur seals on the coastal islands. The following description of that industry was furnished by SOYP:

About 170,000 seals of two coats (a short fine coat and a long rough coat) and 35,000-40,000 seals of one coat (a long rough coat only) breed on Uruguay's coastal islands. The two-coated seals are more prolific and breed in the higher rocky parts of the islands, while the one-coated seals breed on the lower beaches. The one-coated seals remain in close proximity to the mouth of the Rio de la Plata at all times, while the two-coated seals range over a considerably wider stretch of the adjacent South Atlantic areas.

Uruguay (Contd.):

SOYP estimates that in 1964 it harvested 8,000 skins from the two-coated seals and between 2,000 and 2,500 from the one-coated species. The future annual harvest may be increased slightly if the overall population increases.

SOYP reports that up to 1964 it annually sent approximately 2,000 raw seal skins on consignment to a fur company in the United States and sold outright to a London firm about 3,000 skins. Now, however, SOYP has opened a new plant in Uruguay and hopes that it will be able to process all raw seal skins locally. As a result, SOYP has sold Industria Lobera del Uruguay, S.A. (ILUSA), an association of four leading furriers in Uruguay, 8,000 pelts from the 1964 harvest with the understanding that SOYP will do the processing.

SOYP harvests only male seals measuring between 76 and 100 centimeters (about 30 to 39 inches). The harvest, which begins in June when the maximum number of seals are on the islands, is limited to seals between 8 months and 3 years in age.

SOYP officials estimate that raw seal skins of average quality sold on the local market in Uruguay bring 225 to 250 pesos (\$9.40-\$10.40) and the finished skins about 400 pesos (\$16.70). The best seal skins are sent abroad and sold at higher prices on the international market. (United States Embassy, Montevideo, December 16, 1964.)

Note: Uruguayan pesos 24.15 equal US\$1.00.



U.S.S.R.

COD BLOCKS GO TO WEST GERMANY AND OTHER COUNTRIES:

Soviet cod blocks traded to West Germany under a barter agreement are being reexported to France, Australia, and the United Kingdom. A total of 10,000 metric tons of the Soviet cod blocks produced in the North Atlantic, presumably on Georges Bank or the Grand Banks, are to go to West Germany under the barter agreement. The 13½- and 16½-pound blocks in a recent Soviet shipment to Hamburg, Germany, were reported to be of excellent quality and workmanship. However, it was reported that earlier shipments

of the fish blocks had some physical defects, including the presence of bones.

A shipment of 102,900 pounds of Soviet-produced frozen cod blocks arrived at Boston, Mass., in February 1965, together with frozen fishery products from West Germany. It was the first shipment at Boston of cod blocks from Soviet-caught fish in the North Atlantic. The New England fish-processing firm handling the blocks reported them as of a good quality and that prices were at the same level as for the Canadian product. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 3, 1965, and other sources.)

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FISHING GOALS EMPHASIZE HIGH-SEAS FLEET EXPANSION:

The Chairman of the State Fisheries of the Soviet Union said in an interview that fishing on the high seas and at greater depths were their main aims for the future. Their 1965 fisheries catch target would be 5.6 million metric tons.

In the past 15 years, said the Chairman, the Soviet fishing fleet had doubled in size, and its engine power had increased fourfold. In the old days, a fishing trip of 1,500 miles was considered the limit, except for whalers, but today, ocean-going fishing vessels can remain at sea for up to 3 months and travel at 14-16 knots. Factoryships are also coming into general use.

Discussing new vessels, the Chairman claimed that in 1965 the Soviet fishing fleet would become the world's largest. He said a number of new classes of vessels would come into use in the next few years, most notable of which would be the Vostock-class of factory motherships.

Carrying 14 fishing vessels on board, the Vostock would be able to stay at sea for 125 days, in which time it would produce 10,000 tons of frozen fish, 1,000 tons of fish meal, 10 million cans of fish, and about 100 tons of industrial fats.

The Chairman emphasized that fresh-water fishing was not being ignored in the Soviet Union. The development of inland fishing is an important phase of Soviet planning. At present, he said, rivers and reservoirs were yielding only 20 to 60 pounds of fish per acre, where-

U. S. S. R. (Contd.):

as properly farmed ponds were giving 1,000 to 2,000 pounds per acre.

On the subject of fish farms, he said the development of hydroelectric schemes had considerably hampered the natural spawning habits of sturgeon and salmon, but now, with more than 100 Soviet fish farms in operation, this had been overcome. (Fishing News, London, January 29, 1965.)

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DEEP-WATER TRAWLING TESTS IN BERING SEA RESULT IN GOOD CATCHES:

In mid-1964, the Soviet news agency Tass reported on deep-water trawling in the Bering Sea by the Soviet exploratory vessel Academician Berg as follows:

"The large refrigerator trawler... is catching halibut and other fish in the Bering Sea at a depth of 1,000 meters (3,280 feet). The purpose of its voyage, scheduled for almost a month, is to study and improve the techniques of catching fish at great depths. Trawling has shown that there are large stocks of valuable fish in these layers of the Bering Sea and that a big catch can be made there. The Academician Berg is making a



The Soviet trawler Zhemchug fishing in the Bering Sea. Its home port is Vladivostok

daily catch of up to 500 metric centners (110,230 pounds at a depth of 1,000 meters or 3,280 feet). The trawler has of late been evolving methods of fishing at a depth of 1,200 meters (3,936 feet)." The article pointed out that the Academician Berg is a "flag ship of the fish-locating fleet." (Scottish Fisheries Bulletin, No. 22, December 1964.)

Note: See Commercial Fisheries Review, December 1964 p. 114. October 1964 p. 80.

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FISHERY RESEARCH IN PACIFIC OCEAN:

Soviet research expeditions in the Bering Sea, the Gulf of Alaska, the Central Pacific, and the eastern Indian Ocean were organized in 1964 by the Pacific Scientific Research Institute for Fisheries and Oceanography (TINRO), at Vladivostok. Over 20 fishery and oceanographic research vessels were deployed and several hundred scientists participated in the expeditions. A total of 165 scientific papers was published by TINRO scientists. The work of some biologists was considered of such importance that they were proposed as candidates for the Lenin Prize.

In 1965, TINRO will obtain new research vessels and modern electronic instruments to intensify fishery research in the northern, central, and southern Pacific Ocean, as well as in equatorial waters. The emphasis will be on biological studies of saury and tuna, and exploring for commercial quantities of molluscs. Soviet Far Eastern fishing operations are dependent on TINRO's biological studies.

The Soviets plan to catch 1.9 million metric tons of fishery products from their Far Eastern bases in 1965. The 1964 catch from those bases amounted to about 1.8 million tons and 1963 catch was 1.6 million tons. Plans projected for 1970 provide for a Soviet Far Eastern fishery catch of about 3 million tons.

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JAPAN LAUNCHES FIRST OF NEW SERIES OF FACTORYSHIPS FOR SOVIETS:

A Japanese shipbuilder announced the launching at Yokohama on January 14, 1965, of the fish factoryship Spassk (19,000 gross tons), the first of 8 such vessels of the same class for V/O Sudoimport in the Soviet Union.

The Spassk has the following specifications: length between perpendiculars 160 meters (525 feet), breadth moulded 24 meters (79 feet), depth moulded 14.8 meters (48.5 feet), main diesel engine 5,500 brake horsepower at 125 r.p.m., cruising speed 14 knots, gross tonnage 19,000 tons, and deadweight tonnage 10,000 tons.

The Spassk will be equipped with modern equipment for fish processing, canning, and refrigeration. Crew and factory workers on the vessel will total 280 persons.

The Spassk has the approximate daily capacity to freeze 100 metric tons of fish, can 50 tons of fish, pack 100 tons of salt herring

U. S. S. R. (Contd.):

in barrels, and process 20 tons of fish meal. Cold-storage capacity is 12,500 cubic meters (441,434 cubic feet), which can be maintained at -30° C. (-22° F.) even in tropical waters. The Spassk's refrigeration plant can also manufacture 48 tons of ice a day.

The Spassk is scheduled to be delivered to the Soviet Union in April 1964, and all eight factoryships of this class are to be delivered by November 1966. (Fisheries Attache, United States Embassy, Tokyo, February 10, 1965.)

Note: See Commercial Fisheries Review, April 1964 p. 74.

FREEZER-TRAWLER "SKAZOCHNIK ANDERSEN" DELIVERED TO SOVIETS BY DANISH SHIPYARD:

The 2,570-ton freezer-trawler M/S Skazochnik Andersen was delivered to Sudoimport, Moscow, by a Copenhagen shipyard February 10, 1965. The vessel is the 7th in a series of 15 freezer-trawlers for the U.S.S.R. being built by the Danish shipyard to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first vessel in the series was the M/S Skryplev launched May 10, 1962.

The M/S Skazochnik Andersen is designed to serve mainly as a refrigerator vessel, but it can also operate as a stern trawler. Speed

on loaded trials was 14 knots. (Regional Fisheries Attache, United States Embassy, Copenhagen, February 17, 1965.)

Note: See Commercial Fisheries Review, Mar. 1965 p. 93; Feb. 1965 p. 80; Oct. 1964 p. 56, May 1964 p. 75; Mar. 1964 p. 70; and Sept. 1962 p. 71.

ANOTHER LARGE STERN FACTORY TRAWLER LAUNCHED:

The 13th Soviet large stern factory trawler built in 1964, the Grigorii Shelekhov, was launched September 30, 1964, at the U.S.S.R. Nosenko Shipyard at Nikolaev on the Black Sea. It confirms previous estimates that the Nikolaev Shipyards are capable of building from 1 to 2 "Maiakovskii" class trawlers a month. It is estimated that 17 or 18 trawlers of that class were built by the end of 1964.

FAR EASTERN PROVINCE OF SAKHALIN EXPANDS FISHERIES:

The Soviet Far Eastern Province of Sakhalin began a major shift to distant-water fisheries in 1959, according to a report published by the Japanese Government. The change followed the launching in 1959 of a new Soviet 7-Year Economic Development Plan. The Plan set a fisheries production goal of 261,000 metric tons by 1965 for Sakhalin Province (which includes Sakhalin Island and the Kuril Islands). To achieve that target, Sakhalin's fishing industry switched from its dependence on the coastal herring



New Soviet freezer-trawler Skazochnik Andersen.

U. S. S. R. (Contd.):

and salmon fisheries to the development of distant-water fisheries. Effort was also directed toward fishing for saury, scallops, and kelp. As a result, Sakhalin's fisheries production rose from 94,000 metric tons in 1958 to 222,000 tons in 1961, 234,000 tons in 1962, 273,000 tons in 1963, and 288,000 tons as of October 1964.

The catch increase was attributed to the extension of large-scale trawling operations to the eastern Bering Sea and the Gulf of Alaska, and the development of a herring purse-seine fishery in the Okhotsk Sea and northern Bering Sea. In 1963, distant-water operations reportedly accounted for 88 percent of Sakhalin Province's total fishery production.

The Japanese report says that the Soviet fishing fleet presently based in Sakhalin Province includes 3 large refrigerated factory-ships, 5 large stern trawlers, 70 medium and large trawlers, and a number of purse seiners. The Japanese report on Sakhalin was compiled by a Japanese Fisheries Agency official who recently completed his third visit to the Soviet maritime provinces. (Suisan Keizai Shimbun, January 19, 1965.)



United Kingdom

CANADIAN FISHERIES FIRM
JOINS BRITISH FROZEN FOOD CONCERN:

In order to build up its supplies of frozen fish, Britain's largest frozen food company has entered into a partnership with one of Newfoundland's largest fish-processing companies. The Newfoundland firm is processing about 35 million pounds of fish a year in five plants on the Avalon Peninsula. The British firm in the new partnership said the deal would help it to meet its future "ambitious targets in a situation of increasing shortage of the types and quality of fish it requires."

Fishery products hit record sales in Britain in 1964 and accounted for about one-third of the British frozen food market. (The Journal of Commerce, February 15, 1965.)

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METHOD OF PRESERVING FISH IN
ANTIBIOTIC ICE PATENTED:

The German firm Henkel & Cie has been granted British Patent No. 947,688 for a method of preserving fish by storing in a bactericidal ice produced by freezing a 0.01-percent aqueous solution of peracetic acid. (Food Technology, July 1964.)

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MEETING TO BE HELD ON FISHING
VESSEL DESIGN IN RELATION TO
FISH QUALITY IMPROVEMENT:

The British White Fish Authority is sponsoring a meeting in London, May 31-June 1, 1965, on the design of fishing vessels and their equipment in relation to the improvement of fish quality. The meeting will focus on ways to maintain fish quality on vessels at sea. The agenda for the meeting lists the following topics for discussion:

- (1) Design and operation of fishing vessels when the catch is stowed in melting ice. (Fish handling, stowage, and unloading will be discussed as well as fishroom design.)
- (2) Other chilling techniques such as chilled sea water, superchilling, antibiotic ice, and gas stowage.
- (3) Freezer trawlers and their equipment.
- (4) Factory trawlers and motherships.

The meeting on quality and vessel design is scheduled in conjunction with the World Fishing Exhibition to be held May 27-June 2, 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen.)

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SALMON AND TROUT
FISH-FARMING PROJECT PLANNED:

A pilot fish-farm project for breeding and rearing salmon and trout is planned at Inverlort, Scotland, by an internationally known British firm. The firm said that the project is only a pilot plan and that development on any major scale will take place only if the venture is successful.

Planning permission, which has been given in principle by the Invernesshire County Planning Committee, covers a hatchery, ponds,

United Kingdom (Contd.):

houses, and a laboratory. The project will require large quantities of salt water daily, as well as a continuous flow of fresh water, electrical power, and feeding and fertilizing materials. Initially about 20 to 45 persons are expected to be employed.

In May and July 1964, the firm completed an arrangement with Norwegian fish-farming interests which gave them world rights in the exploitation of a system of breeding and rearing salmon and trout.

Investment in the project is expected to be high, and a sum of £2 million (US\$5-6 million) has been indicated. Apart from the actual farming process, a successful project would involve investment in packing, processing and refrigeration, storage and distribution, if the project is to be of economic importance to the area where it is located. (Fish-ing News, London, January 29, 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 115.



Venezuela

TUNA LANDINGS, 1963:

Venezuela's tuna landings in 1963 amounted to 3,089 metric tons valued at 4.6 million Bolívars (US\$1.5 million). All of the tuna catch is sold domestically as fresh fish. (United States Embassy, Caracas, January 20, 1965.)

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SARDINE FISHERY TRENDS AND EXPORTS, 1963:

Venezuela's commercial marine fish and fresh-water fish landings in 1963 totaled 97,442 metric tons valued at 56.5 million Bolívars (US\$18.3 million), an increase of 2.7 percent in quantity from the previous year. Marine fish landings of 90,320 tons for the year included 34,553 tons of sardines valued at about \$1 million, or nearly 40 percent of the total marine fish landings. Anchovy landings for the year were 593 tons.

The sardine canning industry, centered at Cumana in the eastern part of the country, continues to be the largest part of Venezuela's commercial fishery. The sardine fishery is conducted largely out of that area. Sardines are caught in nets because purse seining is prohibited (to protect the resource), and they

can be caught only during certain months of the year.



Fig. 1 - Unloading sardines from boat at a cannery in Venezuela.



Fig. 2 - Packing precooked sardines in cans at a cannery in Cumana.

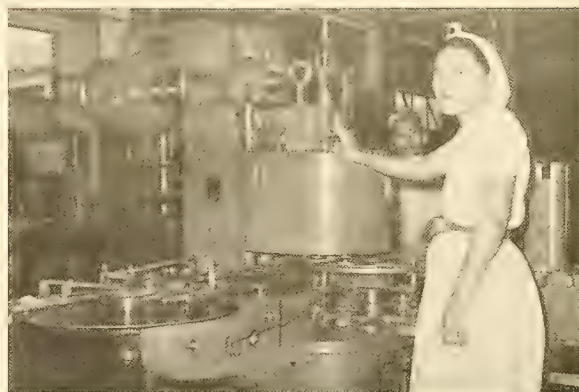


Fig. 3 - Sealing machine used in sardine cannery at Cumana.

About 80 percent of Venezuela's sardine pack is consumed by the domestic market. The Venezuelan Fishermen's Union, however,

Venezuela (Contd.):

believes that exports of canned sardines should be increased and that Venezuela should enjoy a greater share of the world export market.



Fig. 4 - Cases of canned sardines ready for shipment at cannery in Cumana.

Venezuela's canned fish exports in 1963 were mostly canned sardines for a total of 2,071 tons with an export value of \$1.1 million. West Germany, Australia, the United States, and Jamaica were among the principal buyers of Venezuelan canned sardines. (United States Embassy, Caracas, January 20, 1965.)

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SHRIMP FISHERY TRENDS AND EXPORTS, 1963:

Venezuela's shrimp fishery is divided between the Punto Fijo area and Lago de Maracaibo in the western part of the country. In 1963, shrimp landings totaled 8.6 million

pounds valued at 6.2 million Bolivares (US\$2 million), of which 7.4 million pounds valued at \$2.6 million were exported, practically all of it to the United States. The spiny lobster catch for the year was 273,000 pounds.

The Venezuelan Fishermen's Union has complained that Venezuela's shrimp fishery is completely exploited by foreign interests and that about 13 foreign firms operate in the Maracaibo area, only one of which offers steady employment to Venezuelan workers.

Large-scale shrimp fishing is planned in 1965 in the eastern part of the country. Venezuelan industry sources would like to see a pilot fishing project started in the Gulf of Paria and waters near the Orinoco Delta. But opinion is divided as to the possibilities in that region. Some industry members believe that fishing in that region, particularly for shrimp, should be equal to, or better than, in the Gulf of Mexico. Others believe that there is nothing worth fishing for there.

Experiments were conducted in several places of eastern Venezuela with new production techniques. Wire-mesh enclosures were used with success in the cultivation of shrimp in the lagoon of Puerto Piritu in the eastern part of the country, but apparently that technique has not been applied in other areas. (United States Embassy, Caracas, January 20, 1965.)



Yugoslavia

FISHING VESSELS BUILT FOR TUNISIA:

Ten fishing vessels were built for Tunisia at a shipyard in Pula, Yugoslavia. Four of the vessels were to be delivered in December 1964, another 4 in January, and 2 in February 1965.

They are equipped with 200-hp. diesel engines capable of a speed of 10 knots. The vessels are intended for deep-sea fishing. Each has a 1,589-cubic foot cold-storage area, deep-freezing facilities, radio, echo-sounder, and other modern electrical equipment.

The Yugoslav shipyard delivered 5 vessels of the same type to Tunisia about two years ago. (*Privredni pregled*, Belgrade, November 13, 1964.)

Yugoslavia (Contd.):

One of the three tuna purse seiners being built at the Pula shipyard was recently completed. They are scheduled for delivery to a Yugoslav fishing company in May, July, and September 1965.

Note: See Commercial Fisheries Review, January 1964 p. 96.



Zanzibar

SARDINE VESSELS FROM EAST GERMANY:

Six sardine fishing vessels are scheduled to be delivered to Zanzibar in 1965 by East Germany under a trade protocol signed by the two countries in September 1964. Another 4 vessels are to be delivered in 1966 to be followed by 6 more in 1967. The vessel agreement with East Germany was mentioned in a Zanzibar newspaper on January 23, 1965. (United States Consul, Zanzibar, February 5, 1965.)



FISH EAT WEEDS TO AID POWER PLANT OPERATION

Some 15,000 grass-eating fish are helping to keep the lights burning in England. The fish are young grass carp that thrive on the large crops of weeds growing in the Cavendish Dock, which supplies water to the cooling system of the electric power station at Barrow-in-Furness. The fast-growing weeds had clogged the water inlets and often nearly stopped its flow.

The young fish, about 2 to 2.5 inches long, were flown to England from Hong Kong in 60 water-filled plastic bags packed in an electrically-heated box. Upon arrival in England, the fish were put into a 3,000-gallon tank of fresh water. The water was changed gradually until it became a mixture of fresh and salt water similar to that in the dock.

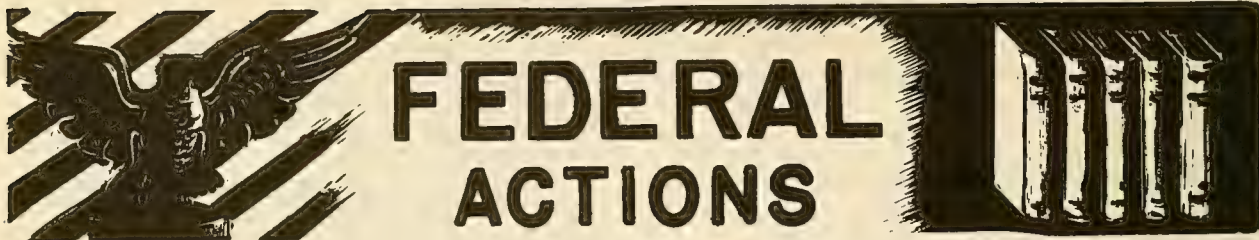
The grass carp, which will weigh about 70 pounds full grown, are busily eating weeds in the dock to keep the water flowing freely.

The Central Electricity Generating Board in England, which ordered the carp, decided to use the fish as a solution to the weed problem after an experiment. In the test 25 grass carp were taken from the London Zoo and put into the dock. Those fish made gluttons of themselves on the vast amount of food available, said the senior chemist to the board. It was then decided that at least 14 tons of grass carp would be needed to keep the weeds down.

The board still has one problem, however, it does not know whether the fish will breed in England. This may mean that the whole operation will have to be repeated in a few years.

Grass carp are being tested in the United States for their ability to eat aquatic weeds. Nearly 100 of those fish were flown from Malaysia early in 1964 to Stuttgart, Ark. They are a possible solution to the aquatic weed problem in lakes, ponds, streams, and fisheries, the Chief, Division of Fish Research, U. S. Fish and Wildlife Service, points out.

Aquatic weeds interfere with fishing, boating, and raising fish, particularly in many southern states of the United States. (Science News Letter, August 29, 1964.)



Department of the Interior

EXTENSION OF FISHERY LOAN PROGRAM REQUESTED:

Congress has been asked for legislation aimed at assuring loans for upgrading and modernizing the commercial fishing fleet of the United States, announced the U. S. Department of the Interior, February 1, 1965, thereby contributing to a more efficient and profitable operation. The loan program is administered by the Department's Bureau of Commercial Fisheries.

The U. S. Department of the Interior requested an amendment to the Fish and Wildlife Act of 1956 which would extend until 1975 the authority to make such loans. The fishery loan section of that Act is scheduled to end June 30, 1965.

Proposed legislation would continue to limit loans from an existing \$13 million revolving fund to applicants unable to obtain financial assistance from other sources at reasonable rates. The Department said the loan program has filled this credit gap and enabled fishermen to obtain financing needed to continue operation of their

vessels. The dual impact of foreign competition and increasing United States imports of fishery products has increased the need for reasonable long-term financing for fishing vessels and gear, the Department explained.

In submitting the legislative proposal, the Department said that as of July 31, 1964, a total of 142 fishing vessels had been replaced under the Act and that 588 other vessels had been converted, rebuilt, repaired, or re-equipped with certain fishing gear or with new engines. In addition, 280 vessel mortgages and lienable debts of another 255 vessels were refinanced. Many of these were multipurpose loans.

The proposed legislation also provides that the annual interest rate on each loan shall be at a rate determined by the Secretary of the Treasury to be consistent with rates of interest on other public loans of comparable maturity.

FISH AND WILDLIFE SERVICE

HEARINGS ON APPLICATIONS FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

The following firms have applied for fishing vessel construction differential subsidies:

Firm and Address	Overall Size	Fisheries	Hearing Notice in <u>Federal Register</u>	Date of Hearing
Jacobsen Fishing Co. Fairhaven, Mass.	96.5 ft.	Groundfish, flounder, lobster	..... (1965)	
Hercules Fishing Products, Inc. Fairhaven, Mass.	100 ft.	Scallop, tuna, groundfish, lobster	Feb. 13	Mar. 16
Elmo, Inc. Port Monmouth, N. J.	220 ft.	Menhaden; other herring-like fish	Feb. 16	Mar. 18
Rockaway, Inc. Port Monmouth, N. J.	"	"	Feb. 20	Mar. 23
Calcasieu, Inc. Port Monmouth, N. J.	"	"	"	"
Boat Gannet Inc. New Bedford, Mass.	96.5 ft.	Groundfish, flounder, lobster	"	"
A. Irving Tormala and Edna E. Tormala Fort Myers, Fla.	85 ft.	Shrimp, snapper, grouper, Atlantic tuna	Feb. 25	Mar. 25
			Feb. 25	Mar. 30

Hearings on the economic aspects of the applications were scheduled to be held in Washington, D. C.

Note: See *Commercial Fisheries Review*, Mar. 1965 p. 98, Feb. 1965 p. 91, Jan. 1965 p. 99.



Department of the Treasury

BUREAU OF CUSTOMS

GROUND FISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1965:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch) fillets and steaks for calendar year 1965 is 24,383,589 pounds, the Bureau of Customs announced in the February 18, 1965, *Federal Register*. Divided into quarterly quotas this means that 6,095,897 pounds of groundfish fillets and steaks during each quarter of 1965 may be imported at the 1-7/8 cents-per-pound rate of duty and any imports over the quarterly quota will be dutiable at the rate of 2-1/2 cents a pound.

Reduced Tariff-Rate Import Quota for
Fresh and Frozen Groundfish Fillets, 1954-1965

Year	Quota Lbs.
	1,000
1965	24,384
1964	24,862
1963	24,875
1962	28,571
1961	32,601
1960	36,533
1959	36,920
1958	35,892
1957	37,376
1956	35,197
1955	35,433
1954	33,950

The reduced-rate import quota for 1965 is 1.9 percent less than the 1964 quota of 24,861,670 pounds. From 1951 to 1960 the quantity of fresh and frozen groundfish fillets permitted to enter the United States at the reduced rate of duty of 1-7/8 cents a pound had increased 24.7 percent, but in 1961 the trend was reversed significantly for the first time because in 1960 frozen fish fillet blocks with bits and pieces were no longer dutiable under the Tariff category of "frozen groundfish fillets." Further declines took place in 1962 and 1963, and the quota for 1965 is about one-half million pounds less than in 1964.

Average aggregate apparent annual consumption in the United States of fresh and frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks, but excluding fish blocks since September 15, 1959, and blocks of fish bits) for the three years (1962-64) preceding 1965 was 162,557,262 pounds, calculated in accordance with headnote 1, Part 3A, Schedule 1, under item 110.50, of the Tariff Schedules of the United States. This was far below the consumption of 217,337,633 pounds in 1958-60 and 243,554,480 pounds for 1957-59.

The notice as it appeared in the *Federal Register* of February 18, 1965, follows:

DEPARTMENT OF THE TREASURY

Bureau of Customs

[T.D. 56360]

CERTAIN FISH

Tariff Rate Quota, 1965

FEBRUARY 12, 1965.

The tariff-rate quota for the calendar year 1965, on certain fish dutiable under item 110.50, Tariff Schedules of the United States.

In accordance with item 110.50 of part 3, schedule 1, Tariff Schedules of the United States, it has been ascertained that the average aggregate apparent annual consumption in the United States of fish, fresh, chilled or frozen, fillets, steaks, and sticks, of cod, cusk, haddock, hake, pollock, and rosefish, in the 3 years preceding 1965, calculated in the manner provided for in headnote 1, part 3A, schedule 1, was 162,557,262 pounds. The quantity of such fish that may be imported for consumption during the calendar year 1965 at the reduced rate of duty under item 110.50 is, therefore, 24,383,589 pounds.

[SEAL] LESTER D. JOHNSON,
Acting Commissioner of Customs.

Note: See *Commercial Fisheries Review*, April 1964 p. 78.



White House

NEW ASSISTANT SECRETARY OF THE INTERIOR FOR FISH AND WILDLIFE:

President Johnson announced his intention on February 11, 1965, to nominate Dr. Stanley A. Cain of Ann Arbor, Mich., as Assistant Secretary of the Interior for Fish and Wildlife to replace former Assistant Secretary Frank P. Briggs, who resigned February 28, 1965.

The new Assistant Secretary has had a long and distinguished career in many fields of conservation and science. From 1950 to 1961 he

was Chairman of the University of Michigan's School of Natural Resources, and since 1950 has been the Charles Lathrop Pack Professor of Conservation. He was president of the Ecological Society of America in 1958 and was vice president of the American Association for the Advancement of Science in 1954.



Dr. Stanley A. Cain

Dr. Cain has been a member of the Advisory Board for Wildlife and Game Management in the Department of the Interior since 1962, and has also

served on the Department of the Interior Advisory Board on National Parks since 1960, and was named Board Chairman in 1964.

A member of the Advisory Board of the Conservation Foundation since 1954, Dr. Cain also has been Chairman of the Environmental Biology Panel of the National Science Foundation in 1958-59, Chairman of the Michigan Department of Conservation during 1963-64, a trustee of the Cranbrook Institute of Science since 1961, a trustee of the National Parks Association since 1963, and has been a representative of the National Academy of Sciences at various international meetings.

He has contributed to two Department of the Interior reports on wildlife and game management and on predator and rodent control, and has received many national and international honors.

Two books have been written by Dr. Cain, and he also is the author of more than 100 articles on botany, biogeography, and conservation.

Born in Jefferson County, Ind., June 19, 1902, Dr. Cain received his Bachelor of Science Degree from Butler University in 1924, his Master of Science Degree from the University of Chicago in 1927, and his Doctor of Philosophy Degree from that University in 1930. He has taught at Butler University, Indiana University, and the University of Tennessee. (News release, Office of the White House Press Secretary, February 11, 1965.)

* * * * *

ADVISORY COMMITTEE ON EXPANDED TRADE WITH SOVIET BLOC:

On February 18, 1965, the President created a special advisory committee to help him explore ways of increasing peaceful trade with the Soviet Union and Eastern European bloc countries. J. Irwin Miller, a businessman from Columbus, Ind., was named chairman of the new committee. The White House Press Secretary said the group's function will be to "survey the field" and report its findings and recommendations to the President. (Evening Star, Washington, D. C., February 18, 1965.)

Senator Magnuson had previously introduced in the Senate on February 1, 1965, a joint resolution (S. J. Res. 36) to develop proposals for the expansion of trade by the establishment of a high-level advisory council. Senator Magnuson in his remarks (Congressional Record, February 1, 1965, pp. 1711-1712) pointed out that the council could advise Congress and the President of the extent to which, and the methods by which, trade in nonstrategic goods and services between the United States and countries within the Communist bloc can profitably be expanded.



Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANTIDUMPING ACT AMENDMENT: H. R. 4970 (Philbin) introduced in House Feb. 16, 1965, to amend the Antidumping Act, 1921; to Committee on Ways and Means. Similar to other bills.

AQUATIC PLANT CONTROL: H. R. 5696 (Long of Md.) introduced in House Mar. 2, 1965, to provide for the control and progressive eradication of certain aquatic plants in the States of Maryland, Virginia, New Jersey and Tennessee; to Committee on Public Works.

S. 1380 (Case) introduced in Senate Mar. 4, 1965, to provide for the control of obnoxious aquatic plants in navigable and allied waters; to Committee on Public Works.

FISHERIES LOAN FUND EXTENSION: H. R. 5153 (Rivers of Alaska) introduced in House Feb. 18, 1965,

to extend the term during which the Secretary of the Interior is authorized to make fisheries loans under the Fish and Wildlife Act of 1956, and for other purposes; to Committee on Merchant Marine and Fisheries. Similar to other bills.

FISH HATCHERIES: H. R. 4886 (Perkins) introduced in House Feb. 15, 1965, to provide for the establishment of a fish hatchery in the State of Kentucky; to Committee on Merchant Marine and Fisheries. Similar to other bills.

FOOD MARKETING NATIONAL COMMISSION: Senate received a letter Feb. 24, 1965, from the Chairman, National Commission on Food Marketing, Washington, D. C., transmitting a draft of proposed legislation to extend for 1 year the date on which the National Commission on Food Marketing shall make a final report to the President and to the Congress and to provide necessary authorization of appropriations for such Commission (with accompanying paper); to Committee on Commerce.

H. R. 5702 (Cooley) introduced in House Mar. 2, 1965, to extend for 1 year the date on which the National Commission on Food Marketing shall make a final report to the President and to the Congress and to provide necessary authorization of appropriations for such Commission; to Committee on Agriculture.

FUR SEALS: Sen. Thurmond in his remarks (Congressional Record, Feb. 19, 1965, pp. A725-A726) stated that in the Feb. 1, 1965, issue of Barron's, a national business and financial weekly, there was a very interesting and revealing article ("The Vanishing Seal: . . .") concerned with the Government contract to process the furs of the national supply of sealskins.

Sen. Gruening remarked (Congressional Record, Mar. 4, 1965, pp. 4072-4073) on the fur sealskin processing contract. He inserted the full text of Alaska State Senate Resolution 30 and news stories appearing in Feb. 25 and 26, 1965, issues of Women's Wear Daily on the Mar. 2 meeting the Alaska congressional delegation had with Secretary of the Interior Udall to discuss the problem of sealskin processing.

GREAT LAKES COMMERCIAL FISHERMEN'S PROBLEMS: Sen. Hart inserted in the Congressional Record, Feb. 11, 1965 (pp. 2571-2572) material made available by the Lake Superior Commercial Fishermen's Association and the Michigan Fish Producers' Association, that documents the reasons why disaster aid is needed by their industry.

HAWAII: House Document H, Doc. 68, Honokahau Harbor, Hawaii (Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, dated July 1, 1964, submitting a report, together with accompanying papers and illustrations, on an interim report on Honokahau Harbor, Hawaii, authorized by the River and Harbor Act approved May 17, 1950), referred to Committee on Public Works, House of Representatives, 89th Congress, 1st Session, Feb. 1, 1965, 78 pp., illus., printed. Besides the favorable report of the District Engineer, it contains comments of various Federal agencies, State of Hawaii, and reports from Chief of Engineers and Board of Engineers for Rivers and Harbors. One section discusses the commercial fishing benefits of the project. It points out that the average annual fish catch for the 6-year period 1956-1961 was about 93,300 pounds valued at \$23,200. An average of about 50 percent increase in

fishing time would increase the average catch to 139,700 pounds valued at \$34,700.

INLAND, GREAT LAKES, AND WESTERN RIVERS RULE FOR SMALL VESSELS: S. 1349 (Magnuson) introduced in Senate Mar. 4, 1965, to amend the inland, Great Lakes, and western rivers rules concerning sailing vessels and vessels under 65 feet in length; to Committee on Commerce. Sen. Magnuson in his remarks (Congressional Record, Mar. 4, 1965, pp. 3990-3991) pointed out that the purpose of the bill is to clarify the duties of small craft when operating in narrow channels in which large vessels are also navigating. The bill would amend the existing inland, Great Lakes, and western rivers rules of the road to provide that, in a narrow channel, a sailing vessel or a steam vessel (any vessel propelled by machinery) under 65 feet in length shall not operate so as to hamper the navigation of larger vessels which can only navigate within the channel.

INTERIOR DEPARTMENT APPROPRIATIONS: The House Subcommittee on Appropriations for the Dept. of the Interior and related agencies held hearings Feb. 9, 1965, on fiscal year 1966 budget estimates of the Office of the Commissioner of Fish and Wildlife and the Bureau of Commercial Fisheries.

Subcommittee of Senate Committee on Appropriations held hearings Feb. 15-19, 1965, on fiscal year 1966 budget estimates for the Department of the Interior and related agencies; received testimony from Secretary of the Interior Udall. On Feb. 17 the State of Washington Senate and Feb. 24, 1965, the House of Representatives laid a resolution before the Senate on the installation of the Willamette Falls fishways under the federally financed Columbia River fishery development program, requesting the restoration of funds for the fishways in the fiscal year 1966 budget of the Interior Department. This was submitted with the concurrence of the Legislature of the State of Oregon. Fishways would improve the economy of the States of Washington and Oregon by increasing the annual production of salmon and steelhead trout by some 320,000 fish, according to the resolution; to Committee on Appropriations. Subcommittee on fiscal 1966 budget estimates for the Department of the Interior and related agencies, of Senate Committee on Appropriations, met Mar. 1-5, 1965. During hearings, Mar. 2, 1965, received testimony from the Commissioner of Fish and Wildlife, Director of Bureau of Commercial Fisheries, and Director of Bureau of Sport Fisheries and Wildlife. Hearings continued.

INTERIOR DEPARTMENT: On Feb. 19, 1965, the Senate Committee on Interior and Insular Affairs received the nomination of Stanley A. Cain, of Michigan, to be Assistant Secretary of the Interior for Fish and Wildlife.

MARINE EXPLORATION AND DEVELOPMENT ACT: H. R. 5884 (Rivers of Alaska) introduced in House Mar. 5, 1965, to provide a program of marine exploration and development of the resources of the Continental Shelf; to Committee on Interior and Insular Affairs.

NATIONAL FISHERY CENTER AND AQUARIUM ADVISORY BOARD: Senate Feb. 23, 1965, announced the Vice President's appointment of Senator Prouty (Vt.) as a member of the National Fisheries Center and Aquarium Advisory Board for a 4-year term.

NATIONAL SCIENCE FOUNDATION: H. Doc. 89, Fourteenth Annual Report of the National Science Foundation (Message from the President of the United States

transmitting, The Fourteenth Annual Report of the National Science Foundation for Fiscal Year 1964, pursuant to the National Science Foundation Act of 1950; referred to the Committee on Science and Astronautics, House of Representatives, 89th Congress, 1st Session, Feb. 15, 1965, 159 pp., printed, illus., and accompanying papers. Contains letters of transmittal, Director's Statement, and program activities of the National Science Foundation. One section of the program deals with oceanographic research vessels and facilities.

NORTH PACIFIC FISHERIES TREATY: House Speaker, Feb. 23, 1965, presented a memorial of the Legislature of the State of Washington relative to requesting full consideration of the value of salmon fisheries to Alaska, to the Pacific Northwest, and to the Nation as a whole, and to take appropriate action necessary to preserve this industry; to Committee on Merchant Marine and Fisheries.

The Senate of the State of Washington petitioned the Senate to consider with the greatest care the value of our salmon fisheries to Alaska, to the Pacific Northwest, and to the Nation as a whole, and to take all appropriate action necessary to preserve this industry by insisting upon language in the revised treaty that will furnish adequate protection for it; to Committee on Commerce.

Rep. Pelly in extension of remarks in Congressional Record, Mar. 3, 1965 (pp. A949-A950) inserted the text of a Washington State Senate petition.

Sen. Magnuson inserted in the Congressional Record, Mar. 4, 1965 (pp. 3978-3979) Washington State Senate Resolution No. 1965-24 (adopted Feb. 17). Rep. Meeds inserted the same resolution in the Congressional Record, Mar. 5 (pp. 4139-4140).

OCEANOGRAPHIC AGENCY OR COUNCIL: H. R. 5654 (Fascell) introduced in House Mar. 2, 1965, to provide for expanded research in the oceans and the Great Lakes to establish a National Oceanographic Council, and for other purposes; to Committee on Merchant Marine and Fisheries. Rep. Fascell in his remarks (Congressional Record, Mar. 2, 1965, pp. 3884-3885) pointed out that the Vice President shall be Chairman of the Council and members will include the Secretaries of State, Treasury, Defense, Interior, Commerce, Health, Education, and Welfare, Director of the Office of Science and Technology, Chairman of the Atomic Energy Commission, Director of the National Science Foundation, and the Secretary of the Smithsonian Institution. Purpose is to set forth policy and furnish the guidance, cooperation, and coordination needed to develop ocean research to the fullest extent. It would also help centralize and more readily provide significant and timely information to high officials, including Congress, about these aims and activities.

Senate Committee on Commerce met Feb. 19, 1965, on S. 944, to establish a National Oceanographic Council. Would establish a policy and purpose for national oceanographic program; and provide high-level guidance and coordination of Government activities. Hearings were held and testimony was received from Director, Office of Science and Technology; Assistant Secretary of the Navy for Research and Development; and Chairman, Interagency Committee on Oceanography. Hearings were recessed subject to call.

OCEANOGRAPHY: Rep. Keith in his remarks in Congressional Record, Feb. 25, 1965 (pp. A826-A827)

commented on the special report of the Committee on Oceanography of the National Academy of Sciences--National Research Council, "Economic Benefits From Oceanographic Research": "The committee--NASCO--... has made a detailed and thoughtful evaluation of future economic benefits that could result from oceanographic research, and compares these benefits with the cost of doing the research." He inserted an editorial ("Would Do Well"), by the Cape Cod Standard Times, Hyannis, Mass., on the report.

On Mar. 2, the House and on Mar. 4, 1965, the Senate received a communication from the President of the United States, on the national oceanographic program for fiscal year 1966; referred to House Committee on Merchant Marine and Fisheries and Senate Committee on Commerce.

Sen. Magnuson in an extension of remarks (Congressional Record, Mar. 4, 1965, pp. A969-A970) inserted an article ("Oceanography and the National Welfare") written by Rear Adm. Denys W. Knoll, U. S. Navy, from the Dec. 1964 issue of Navy. In the same day's Record (pp. A957-A959) Sen. Magnuson inserted Capt. T. K. Treadwell's (U. S. Navy) article ("The Soviet Effort in Oceanography") from the same issue of Navy.

Rep. Findley (Congressional Record, Mar. 5, 1965, pp. A990-A991) in extension of remarks inserted an article ("Wilson Urges U. S. Agency to Direct Oceanography") from the Pacific Coast Industry & Electronic News, outlining the efforts being made by Congressman Bob Wilson of California in behalf of streamlining and expediting the various aspects of oceanographic research by the Government.

OCEANOGRAPHY LEGAL PROBLEMS: H. R. 5175 (Lennon) introduced in House Feb. 18, 1965, providing for a study (by U. S. Coast Guard) of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds, to Committee on Merchant Marine and Fisheries.

OUTER CONTINENTAL SHELF RESTRICTED AREAS: H. R. 5270 (Aspinall) introduced in House Feb. 23, 1965, to provide for the restriction of certain areas in the Outer Continental Shelf, known as the Corpus Christi Offshore Warning Area, for defense purposes and for other purposes; to Committee on Interior and Insular Affairs.

H. R. 5271 (Aspinall) introduced in House Feb. 23, 1965, to provide for the restriction of a certain area in the Outer Continental Shelf for defense purposes, and for other purposes (Matagorda Water Range); to Committee on Interior and Insular Affairs.

The Public Lands Subcommittee of Senate Committee on Interior and Insular Affairs, Feb. 25, 1965, in executive session approved for full committee consideration certain bills to restrict for defense purposes certain areas in the Outer Continental Shelf: S. 426, the Eastern Test Range; S. 427, the Gulf Test Range; S. 428, the Matagorda Water Range; and S. 645, the Corpus Christi Offshore Warning Area for Navy use for 6 years. Prior to this action testimony was received from various government officials.

PESTICIDES RESEARCH: House received a letter Mar. 5, 1965, from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation entitled "A bill to amend the act of Aug. 1, 1958, relating to a continuing study by the Secretary of the Interior of the effects of insecticides, herbicides, fungicides, and

other pesticides upon fish and wildlife for the purpose of preventing losses to this resource"; to Committee on Merchant Marine and Fisheries. To increase fund authorization.

SCIENCE AND TECHNOLOGY COMMISSION: S. 1136 (McClellan and 4 others) introduced in Senate Feb. 17, 1965, for the establishment of a Commission on Science and Technology; to Committee on Government Operations. Sen. McClellan in his remarks (Congressional Record, Feb. 17, 1965, pp. 2709-2710) pointed out that this bill provides for the establishment of a Hoover-type commission composed of representatives from the legislative and executive branches of the Government and of persons from private life who are eminent in one or more fields of science or engineering, or who are qualified and experienced in policy determination and administration of industrial scientific research and technological activities. Objective is a study of all of the programs, methods, and procedures of the Federal departments and agencies which are operating, conducting, and financing scientific programs to bring about more economy and efficiency. (Similar to bills in 88th Congress, particularly S. 816, passed by Senate Mar. 8, 1963, and referred to House Committee on Science and Astronautics; no further action.)

SMALL BUSINESS DISASTER LOANS: Introduced in House, H. R. 4978 (Teague of Calif.) Feb. 16, 1965, and H. R. 5507 (Don H. Clausen) Feb. 25, 1965, to authorize additional funds to be available exclusively for disaster loans; to Committee on Banking and Currency. Similar to other bills.

SUPPLEMENTAL APPROPRIATIONS FY 1965: H. Doc. 98, Supplemental Estimate of Appropriations for Various Agencies and the District of Columbia: Communication from the President of the United States transmitting a report indicating the necessity for a supplemental estimate of appropriations for fiscal year 1965 for various agencies and the District of Columbia; referred to Committee on Appropriations, House of Representatives, 89th Congress, 1st Session, Mar. 2, 1965, 26 pp., printed. Includes, among others, increased pay costs for the Office of the Commissioner of Fish and Wildlife, Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife Service.

SUSQUEHANNA RIVER DAM: H. R. 5423 (Rhodes of Pa.) and H. R. 5430 (Schneebeli) introduced in House and S. 1265 (Clark and Scott) introduced in Senate, Feb. 24, 1965, to authorize the construction of a dam on the Susquehanna River, Pa., to respective Committees on Public Works. Sen. Clark in his remarks (Congressional Record, Feb. 24, 1965, pp. 3392-3393) pointed out that a separate fishway will be provided in order not to interfere with fish runs.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: H. R. 5788 (Fallon) introduced in House Mar. 3, 1965, to provide for the conveyance of certain real property of the United States to the State of Maryland; to Committee on Interior and Insular Affairs. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Md. (Similar to H. R. 2888 and S. 673, 88th Congress; hearing held on House bill; no further action.)

TRADE AGREEMENT AUTHORITY: H. R. 5566 (Derwinski) introduced in House Mar. 1, 1965, to amend the Trade Expansion Act of 1962 to provide that the authority to enter into trade agreements under such act will expire at the close of 1965; to Committee on Ways and Means.

TRADE EXPANSION ACT ADJUSTMENT ASSISTANT AMENDMENT: S. 1333 (Hartke) introduced in Senate Mar. 1, 1965, to amend the adjustment assistance provisions of the Trade Expansion Act of 1962 with respect to determinations by the Tariff Commission of injury or threatened injury to firms or groups of workers; to Committee on Finance. Under the amendment, it must be established to the satisfaction of the Tariff Commission that the increased imports are attributable in whole or in part to concessions under trade agreements; also that the increased imports have been the predominant factor in causing, or threatening to cause, serious injury to a firm, or unemployment or underemployment of a group of workers. Changes in the adjustment assistance provisions relate to the standards to be applied by the Tariff Commission in measuring injury to firms and unemployment of workers.

WATER POLLUTION CONTROL ACT: Special Subcommittee of Senate Committee on Public Works on Air and Water Pollution met Feb. 23, 24, and 26, 1965, on S. 560, proposed Federal Installations, Facilities, and Equipment Pollution Control Act.

WATER POLLUTION CONTROL ADMINISTRATION: Introduced in House, H. R. 4953 (Howard) Feb. 16, 1965; H. R. 5036 (Giaino) and H. R. 5071 (Helstoski) Feb. 17; H. R. 5151 (Reuss) and H. R. 5159 (Schmidhauser) Feb. 18; H. R. 5411 (McGrath) Feb. 24, 1965; to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, etc.; to Committee on Public Works. Similar to other bills.

Committee on Public Works held hearing Feb. 18-19, 1965, on H. R. 3988, S. 4, and related bills. Testimony was given by Secretary of the Interior Udall, and Representatives Dingall, Ottinger, McCarthy, and Saylor. Hearing continued Feb. 23.

WATER PROJECT RECREATION ACT: S. 1229 (Jackson) introduced in Senate Feb. 19, 1965, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple purpose water resource projects, and to provide the Secretary of the Interior with authority for recreation development of projects under his control; to Committee on Interior and Insular Affairs. Also, H. R. 5269 (Aspinall) introduced in House Feb. 23; to Committee on Interior and Insular Affairs; similar to S. 1229 and H. R. 52.

Subcommittee on Irrigation and Reclamation of House Committee on Interior and Insular Affairs, Mar. 5, 1965, considered H. R. 5269. Testimony was given by Assistant Secretary of the Interior and public witnesses. Then full Committee met Mar. 10, 1965, on the bill.

WATER RESOURCES PLANNING ACT: River Basin Planning Act: Hearing before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, United States Senate, 89th Congress, 1st Session, on S. 21 (a bill to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commissions, and by providing financial assistance to the states in order to increase state participation in such planning), Feb. 5, 1965, 42 pp., printed. Contents include departmental reports; statements and communications from various Federal officials, Senators, and associations. Appendix contains excerpts from Senate report on S. 1111 (88th Congress).

Senate Committee on Interior and Insular Affairs, Feb. 24, 1965, in executive session, ordered reported favorably with amendments S. 21, proposed Water Resources Planning Act. Same day bill was reported to Senate (S. Rept. 68).

S. Rept. 68, Water Resources Planning Act (Feb. 24, 1965, report from the Committee on Interior and Insular Affairs, U. S. Senate, 89th Congress, 1st Session, to accompany S. 21), 10 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, major provisions of the bill, background, and presents agency reports. Bill is to encourage the wise management, orderly development, and highest possible uses of water and related land resources through coordinated and cooperative efforts by Federal agencies and the State and local governments. Would establish a Water Resources Council; authorize the President to create river basin commissions for coordinated studies and planning within a State, basin, or group of basins; and provide Federal grants to States to assist

them in developing comprehensive water and related land resources plans.

Senate Feb. 25, 1965 passed with committee amendments S. 21 and sent it to the House on Mar. 1, for concurrence. On same day House referred S. 21 to Committee on Interior and Insular Affairs. Sen. Ellender inserted some remarks in Mar. 4 Congressional Record (pp. 4094-4095) on S. 21.

WATER RESOURCES RESEARCH: Irrigation and Reclamation Subcommittee of Senate Committee on Interior and Insular Affairs met Mar. 2, 1965, on S. 22, authorizing additional funds to promote a wider national program of water research. On same date began hearings, and concluded them Mar. 3.

Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS: The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.



FOOD PRESERVATION BY IRRADIATION OUTLINED IN ARMY'S PETITION TO FOOD AND DRUG ADMINISTRATION

The original petition by the Army's Quartermaster General to the Food and Drug Administration (FDA) for permission to use gamma radiation for food preservation has been released to industry. The petition, approved in 1963 by the FDA, is available from the U.S. Department of Commerce through its Office of Technical Services. It describes the complete irradiating process for canned bacon--the initial food product irradiated by the Cobalt-60 source used by the Army's investigators.

"A milestone in the history of food preservation," says the Quartermaster General, referring to the FDA's approval of the ionizing radiation process. "It culminates a decade of U. S. Army-sponsored research. This is the first approval obtained from a regulating agency of any country for a radiation sterilized food. It opens the way for the development of the first new method of food preservation, except for canning, since the dawn of history."

The process yields a safe irradiated product which remains free from toxic and other micro-biological spoilage. And the precedents established by the Army's petition for the approval of the process with the research data that accompanied it, facilitated the later clearances of other irradiated foods. For example, wheat and wheat products can be disinfested by gamma radiation. White potatoes can be sprout-inhibited. The shelf life of fresh fish can be extended.

"This petition," says the Army, "and the years of research it represents will be instrumental in the future clearance of a broad spectrum of radiation-preserved foods. The removal of legal restrictions for unrestrained consumption of these foods will open up new industries, help raise living standards, and reduce the incidence of food borne disease throughout the world."

You can buy Use of Ionizing Gamma Radiation from a Cobalt-60 Source for Preservation of Bacon for \$3.00. Order publication PB 166 130N from OTS, U. S. Department of Commerce, Washington, D. C. 20230.

Note: See Commercial Fisheries Review, June 1964 p. 24.



RECENT FISHERY PUBLICATIONS

FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
WL - WILDLIFE LEAFLET.

- | Number | Title |
|----------|---|
| CFS-3453 | - Canned Fishery Products, 1963 Annual Summary (Revised), 18 pp. |
| CFS-3454 | - Industrial Fishery Products, 1963 Annual Summary (Revised), 9 pp. |
| CFS-3537 | - Fish Meal and Oil, May 1964, 2 pp. |
| CFS-3564 | - Shrimp Landings, March 1964, 5 pp. |
| CFS-3601 | - Hawaii Landings, 1963 Annual Summary, 4 pp. |
| CFS-3616 | - Chesapeake Fisheries, 1963 Annual Summary, 9 pp. |
| CFS-3617 | - Texas Landings, June 1964, 2 pp. |
| CFS-3627 | - Texas Landings, 1963 Annual Summary (Revised), 9 pp. |
| CFS-3679 | - Gulf Fisheries, 1963 Annual Summary, 16 pp. |
| CFS-3681 | - Gulf Coast Shrimp Data, August 1964, 20 pp. |
| CFS-3683 | - North Carolina Landings, October 1964, 4 pp. |
| CFS-3684 | - New Jersey Landings, October 1964, 3 pp. |
| CFS-3691 | - Alaska Fisheries, 1963 Annual Summary, 8 pp. |
| CFS-3692 | - Michigan, Ohio & Wisconsin Landings, September 1964, 4 pp. |
| CFS-3695 | - Mississippi Landings, August 1964, 3 pp. |
| CFS-3696 | - Maryland Landings, October 1964, 4 pp. |
| CFS-3697 | - Fish Meal and Oil, October 1964, 2 pp. |
| CFS-3698 | - Shrimp Landings, September 1964, 5 pp. |
| CFS-3699 | - Gulf Coast Shrimp Data, September 1964, 20 pp. |
| CFS-3700 | - North Carolina Landings, November 1964, 4 pp. |
| CFS-3701 | - New York Landings, October 1964, 5 pp. |
| CFS-3702 | - Rhode Island Landings, August 1964, 3 pp. |
| CFS-3703 | - Shrimp Landings, October 1964, 5 pp. |
| CFS-3705 | - Louisiana Landings, October 1964, 3 pp. |
| CFS-3706 | - Alabama Landings, October 1964, 3 pp. |
| CFS-3707 | - Virginia Landings, October 1964, 4 pp. |
| CFS-3708 | - Maine Landings, October 1964, 4 pp. |

- CFS-3709 - Florida Landings, November 1964, 8 pp.
CFS-3711 - Mississippi Landings, September 1964, 3 pp.
CFS-3713 - California Landings, August 1964, 4 pp.
CFS-3716 - Rhode Island Landings, September 1964, 3 pp.

Sep. No. 728 - Review of the Development of the Atlantic Coast Tuna Fishery.

Sep. No. 729 - How Tuna See A Net.

FL-522 - Separates from the Commercial Fisheries Review, 9 pp., revised July 1964. Contains a list of available reprints of articles from Commercial Fisheries Review, listed alphabetically by subject.

FL-588 - Index of Publications by the Branch of Technology, Bureau of Commercial Fisheries, 1955-59, Inclusive, by F. Bruce Sanford and Helen E. Plastino, 28 pp., 1964.

SSR-Fish. No. 483 - Intertidal Ecology and Life History of Pink Salmon at Olsen Creek, Prince William Sound, Alaska, by John H. Helle, Richard S. Williamson, and Jack E. Bailey, 28 pp., illus., Sept. 1964.

SSR-Fish. No. 486 - Salmon Tagging Experiments Along the South Shore of Unimak Island and the Southwestern Shore of the Alaska Peninsula, by Fredrik V. Thorsteinson and Theodore R. Merrell, Jr., 17 pp., illus., Oct. 1964.

SSR-Fish. No. 487 - Distribution and Seasonal Occurrence of *Gymnodinium breve* on the West Coast of Florida, 1954-57, by John H. Finucane, 17 pp., illus., Sept. 1964.

SSR-Fish. No. 490 - A Remote Controlled Underwater Photographic Surveillance System, by Paul J. Kruse, Jr., 18 pp., illus., Sept. 1964. Describes an underwater motion picture camera system which has been developed and used to study midwater trawling operations. The photographic equipment is handled by remote control from the vessel deck and records both trawl mechanics and fish escape reactions. The equipment has been tested and placed in operation in studies in the Gulf of Mexico.

SSR-Fish. No. 492 - Releases and Recoveries of Drift Bottles and Cards in the Central Pacific, by Richard A. Barkley, Bernard M. Ito, and Robert P. Brown, 33 pp., illus., 1964.

WL-460 - Fur Catch in the United States, 1963, 4 pp., 1964.

Annual Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1962, Circular 184, 42 pp., illus., September 1964. Presents information on research programs conducted by the laboratory including blue crab, menhaden, shad, Atlantic Coast striped bass, and radiobiological studies.

Annual Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N. C., for the Fiscal Year Ending June 30, 1963, Circular 198, 26 pp., illus., Nov. 1964. Contains accounts of the work accomplished during FY 1963, including the Director's report covering research highlights, and participation in the Atlantic States Marine Fisheries Commission, training programs, and work conferences; the blue crab program in North Carolina and Florida; the menhaden program covering sampling and population studies and marking methods; the shad program with details on population dynamics and fishway studies; and the Atlantic Coast striped bass program in Albemarle Sound and Chesapeake Bay. Also included are summaries of library activities, seminars presented, meetings attended, and publications by staff members.

Commercial Fisheries of the United States, Conservation Note 2, 8 pp., illus., processed, revised Aug. 1964. Primarily for use as a teaching aid in schools, this leaflet describes briefly the biological and economic classification of fish and shellfish; what man must know--the fishery conservationist's work in learning the maximum sustainable yield for each species and predicting abundance, and in advising the fishing industry how to make the best possible catch without damage to the resource, how to get high-quality fishery products to the family table at a reasonable price, and how to make the best use of fish for industrial purposes. Also discusses the work of the U. S. Bureau of Commercial Fisheries in getting the needed facts--on life histories of various fish species, habitat, the food chain, tagging of fish, color marking, electronic fish finders and other apparatus, gear studies, exploratory fishing, preserving fishery products, developing new products, maintaining quality, and marketing fishery products; other information on marine mammals, international and interstate commissions, and the American catch, and gear and vessels required to land the catch. Two series of sketches depict the gear used to catch finfish and that used to land shellfish.

Reservoir Fishery Research Strategy and Tactics, by Robert M. Jenkins, Circular 196, 15 pp., illus., July 1964.

THE FOLLOWING REPRINTS FROM FISHERY BULLETIN, VOL. 63, NO. 2, 1964, ARE AVAILABLE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240.

A Benthic Community in the Sheepscot River Estuary, Maine, by Robert W. Hanks, pp. 343-353, illus., printed.

Dentition of the Northern Fur Seal, by Victor B. Schaffer and Bertram S. Kraus, pp. 293-342, illus., printed.

An Experimental Evaluation of the C¹⁴ Method for Measuring Phytoplankton Production, Using Cultures of DUNALIELLA PRIMOLECTA Butcher, by William H. Thomas, pp. 273-292, illus., printed.

A Morphometric Study of Yellowfin Tuna THUNNUS ALBACARES (Bonnaterre), by William F. Royce, pp. 395-443, illus., printed.

Origins of High Seas Sockeye Salmon, by Fred C. Cleaver, pp. 445-476, illus., printed.

Preconstruction Study of the Fisheries of the Estuarine Areas Traversed by the Mississippi River-Gulf Outlet Project, by George A. Rounsefell, pp. 373-393, illus., printed.

Relation between Spawning-Stock Size and Year-Class Size for the Pacific Sardine SARDINOPS CAERULEA (Girard), by John S. MacGregor, pp. 477-491, illus., printed.

Sexual Maturation and Spawning of Atlantic Menhaden, by Joseph R. Higham and William R. Nicholson, pp. 255-271, illus., printed.

Upwelling in the Costa Rica Dome, by Klaus Wyrski, pp. 355-372, illus., printed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-32	Venezuelan Commercial Catch, Foreign Trade, and Major Developments, 1963, 16 pp.
MNL-94	Malta's Fishing Industry, 1964, 12 pp.
Checklist of Reports Issued by Fishery Market News Service, February 1965, 6 pp.	

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE TECHNOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, GLOUCESTER, MASS. 01930.

A Rapid New Electronic Process for Determining the Freshness of Salt-Water Fish, by Chr. Hennings, 17 pp., processed. (Translated from the German, Zeitschrift für Lebensmittel-Untersuchung und-Forschung, vol. 119, no. 6, 1963, pp. 461-477.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII, 96812.

On the Structure of Yellowfin Tuna Schools as Seen from the Distribution of the Catch on the Tuna Longline, by Nobuo Hirayama, 3 pp., processed. (Translated from the Japanese, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 7, 1957, pp. 373-375.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ON LOAN ONLY FROM THE BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII, 96812.

A Population Study on the So-Called Makajiki (Striped Marlin) of Both Northern and Southern Hemispheres of the Pacific. II--Fishing Conditions in the Southern Hemisphere, by Misao Honma and Tadao Kamimura, 10 pp., processed. (Translated from the Japanese, Report of the Nankai Regional Fisheries Research Laboratory, no. 8, March 1958, pp. 12-21.)

THE FOLLOWING TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE FROM THE TRANSLATION PROGRAM, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

"Data on salmon predation. 1--On predation on salmon by fur seals," article, Data on Salmon Predation, 5 pp., processed. (Translated from the Japanese, North Pacific Mothership Association, Japan, 1959.)

"Morphological differences between summer and autumn chum salmon Oncorhynchus keta (Walbaum), O. keta

(Walbaum) *infraprecies autumnalis* Berg," by L. D. Grigo, article, Pacific Salmon: Selected Articles from Soviet Periodicals, pp. 13-17, processed. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 92, no. 6, 1953, pp. 1225-1228.)

Present Status of Soviet Russian Far Eastern Fisheries and Japanese-Soviet Fishery Negotiations, by Nobuhiko Hanamura, Translation Series No. 23, 4 pp., processed. (Translated from the Japanese, Suisan Kagaku, vol. 6, nos. 3-4, 1957, pp. 25-28.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ON LOAN ONLY FROM THE TRANSLATION PROGRAM, U. S. BUREAU OF COMMERCIAL FISHERIES, 2725 MONTLAKE BLVD. E., SEATTLE, WASH. 98102.

The Contemporary State of Active Marine Fisheries in Kamchatka, by V. S. Gorelik, 21 pp., processed. (Translated from the Russian, Vladivostok, Izvestiya Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khozyaistva i Okeanografii, vol. 44, 1957, pp. 223-243.)

Studies on the Albacore. V--The Fishing Condition and Size of Albacore Taken in the South Pacific, by Misao Honma and Tadao Kamimura, 7 pp., processed. (Translated from the Japanese, Report of Nankai Regional Fisheries Research Laboratory, no. 6, March 1957, pp. 84-90.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE FROM THE BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

III--Japanese Thinking Vis-a-Vis United States Yellowfin Tuna Regulations, Translation Series No. 12, 6 pp., processed, Feb. 1965. (Translated from the Japanese, Background of the U. S. Regulatory Act for Yellowfin Tuna, 1962, pp. 36-41.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, Dec. 1964, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, Dec. 1964, 18 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; Oregon and Washington receipts (domestic and imports) of fresh and frozen tuna and tunalike fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, Dec. 1964 and Jan. 1965, 8 and 13 pp. respectively, illus. (U. S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Con-

tains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the months indicated. The January issue contains an article, "Shark tagging in the eastern Pacific," by Susumu Kato.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, Nov. and Dec. 1964, 14 pp. each. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the months indicated.

Fishery and Oceanography Translations, no. 3, Dec. 1964, 36 pp., processed. (Translation Program, Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. E., Seattle, Wash. 98102.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, Dec. 1964, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf menhaden landings and production of meal, solubles, and oil; and sponge sales; for the month indicated.

Hydrographic Observations of Tampa Bay, Florida, and Adjacent Waters, August 1961 through December 1962, by Carl H. Saloman, John H. Finucane, and John A. Kelly, Jr. Data Report No. 4, 6 microfiche cards, Jan. 1965. (Branch of Reports, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington, D. C. 20240.)

To Keep Fish Fresh, Circular No. C-190, 12 pp., illus., printed, Aug. 1964. (Technological Laboratory, U. S. Bureau of Commercial Fisheries, Gloucester, Mass. 01930.) Outlines briefly, with the use of drawings and photos, the Laboratory's principal research work--preservation and engineering, protein investigations, information services, irradiation preservation, radiation pasteurization, flavor and odor studies, specifications development, and standards development. The title states the ultimate goal of the work--to keep fish fresh.

New England Fisheries--Monthly Summary, Dec. 1964, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--Oct. 1964, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, Jan. 1965, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; shrimp landings; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

"A review of advances in the study of diseases of fish: 1954-64," by George Post, article, The Progressive Fish-Culturist, vol. 27, no. 1, Jan. 1965, pp. 3-12, processed, single copy 25 cents.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ABALONE:

"Studies on the nutrition of abalone. I--Feeding trials of abalone, Haliotis discus Reeve, with artificial diets," by Chinkichi Ogino and Eisuke Ohta, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, July 1963, pp. 691-694, printed, Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

ALGAE:

How to Control Algae (Water Bloom-Pond Scum), Fisheries Leaflet No. 3, 3 pp., printed, 1960. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

"Key to the genera of the larger green and brown algae around Sydney," by Margaret M. Mackay, article, Proceedings, Linnean Society of New South Wales, vol. 88, no. 3, 1964, pp. 361-363, printed, Linnean Society of New South Wales, Science House, 157 Gloucester St., Sydney, Australia.

ANCHOVY:

"Anchoveta--¿aplacara el hambre?" (Anchovy--will it appease hunger?), article, Mundo Pesquero, vol. 2, no. 15, Nov. 1964, pp. 11-13, illus., printed in Spanish, single copy \$/ 6.00 (about 25 U. S. cents), Mundo Pesquero, Av. Oscar R. Benavides 1207 (Colonial), Lima, Peru.

ANESTHETICS:

"Anesthetic effect of 4-Styrylpyridine on lamprey and fish," by John H. Howell and Paul M. Thomas, article, Transactions of the American Fisheries Society, vol. 93, no. 2, 1964, pp. 206-208, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

AQUATIC WEEDS:

How to Control Emergent, Marginal, and Floating Aquatic Weeds, Fisheries Leaflet No. 1, 3 pp., printed, 1960. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

The following abstracts of articles are from Weed Abstracts, vol. 12, 1963, printed, British Weed Control Council, 58 Mark Lane, London, England.

These are from no. 6:

"Aquatic weed control and research in the West," by F. L. Timmons, Abstract No. 1663.

"Control of Eurasian water milfoil (M. spicatum) in TVA reservoir," by G. E. Smith, Abstract No. 1669.

"Mass treatment with 2, 4-D of milfoil in tidal creeks in Virginia," by D. Haven, Abstract No. 1668.

"Progress report on distribution and control of Eurasian water milfoil in the Chesapeake Bay region, 1962," by J. H. Steenis and V. D. Stotts, Abstract No. 1667.

"Results of 3 years of testing Diquat as an aquatic herbicide in Florida," by R. D. Blackburn and L. W. Weldon, Abstract No. 1675.

This from no. 5:

"Aquatic weed control," by E. C. Hughes, Abstract No. 1314.

ARGENTINA:

"La pesca en Republica Argentina" (The fishery in the Republic of Argentina), by E. Postel, article, La Pêche Maritime, vol. 44, no. 1042, Jan. 1965, pp. 16-19, illus., printed in French, single copy 14 F (about US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France.

AUSTRALIA:

Manufacturing Industries, 1962-63, No. 23--Meat and Fish Preserving, by K. M. Archer, 9 pp., processed, Dec. 14, 1964. Commonwealth Bureau of Census and Statistics, Canberra, A. C. T., Australia.

BALTIC SEA:

Changes in the Stocks of Commercial Fishes in the Baltic Sea under the Influence of Oceanographic Factors, by T. F. Dement'eva, OTS 64-21653, 10 pp., processed, 1964. (Translated from the Russian, Okeanologiya, vol. 3, no. 5, 1963, pp. 876-885.) Office

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

BIOCHEMISTRY:

Biosynthesis of Trimethylammonium Compounds in Aquatic Animals. IV--Precursors of Trimethylamine Oxide and Betaine in Marine Teleosts, by E. Bilinski, 7 pp., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 21, no. 4, 1964, pp. 765-771.) Technological Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

CALIFORNIA:

Forty-Eighth Biennial Report, July 1, 1962-June 30, 1964, 40 pp., illus., printed. Conservation Education Division, California Department of Fish and Game, 1416 9th St., Sacramento, Calif. Discusses activities of the Department of Fish and Game, 1962-1964, including, among others, work with inland fisheries, salmon and steelhead, marine resources, law enforcement, and pollution and pesticides. Also covered are how the Department of Fish and Game works, water projects, delta study, fish and wildlife planning, and conservation education.

Freshwater Nongame Fishes of California, by J. Bruce Kimsey and Leonard O. Fisk, 54 pp., illus., printed, 1964. Department of Fish and Game, 722 Capitol Mall, Sacramento, Calif. 95814.

CANADA:

"The fisheries of Quebec," article, Trade News, vol. 17, no. 5, Nov. 1964, pp. 6-8, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. During the past 20 years, fishermen in Quebec have landed between 100-150 million pounds of fish a year. Depending on fluctuations in the landed price of fish, the value of the annual catches varied between C\$2 million to \$5 million. Catches of salt-water fish in 1962 reached 130.9 million pounds, while the fresh-water catches amounted to 2.5 million pounds. Cod accounts for more than 60 percent of the landings. Fishing gear consist of hand lines, cod traps, trawl lines with hooks, and otter trawls.

The following all processed in French and English and available from Queen's Printer and Controller of Stationery, Ottawa, Canada:

Fisheries Statistics, Alberta and Northwest Territories, 1963, Catalogue No. 24-212, 12 pp., Dec. 1964, C\$0.50. Contains tables giving the value of fishery products by species in Alberta, 1956-63; quantity and value of fish landings, 1962-63; and quantity landed by species with landed and marketed value, by lakes. Also presents tables showing value of fishery products by species Northwest Territories, 1956-63; quantity and value of landings, 1962-63; quantity and value of fishery products; capital equipment employed in primary operations; and number of persons engaged in the fisheries.

Fisheries Statistics of Canada, 1962 (Canada Summary), Catalogue No. 24-201, 59 pp., Dec. 1964, C\$0.75. This report provides a summary of the Canadian fisheries, arranged to show separately the three main fisheries--Atlantic, Pacific, and Inland. Contains statistical tables on quantity and value of land-

ings by species and provinces; value of exports and imports of fish and fishery products; number of vessels engaged in fishing; employment in the primary industry; Canadian lobster pack; British Columbia salmon pack; and fishing bounties paid to vessels. Also includes tables showing sea fish, including molluscs and crustaceans, landed in Nova Scotia, New Brunswick, and Prince Edward Island in 1962, classified by ICNAF division and fisheries districts.

Fisheries Statistics, Manitoba, 1963, Catalogue No. 24-210, 10 pp., Dec. 1964, C\$0.50. Contains tables giving the value of fish landed in Manitoba, 1956-1963; quantity and value of landings by species and fisheries districts, 1962-63; quantity and value of fishery products by species; capital equipment used in the primary fishery operations; and the number of persons engaged in the fisheries.

Fisheries Statistics, Prince Edward Island, 1963, Catalogue No. 24-203, 24 pp., illus., Jan. 1965, C\$0.50. Consists of statistical tables giving the quantity and value of landings, 1951-63; quantity and value of landings and processed products, 1962 and 1963; classification of fishing vessels by tonnage, type of gear used, length, and fisheries districts; new capital investment in the commercial fishery; number of fishermen by extent of employment; and persons engaged in the major fisheries.

Situation Économique de la Pêche Côtière du Québec (Economic Position of Quebec's Coastal Fishery), by Marcel Daneau, 182 pp., printed in French, 1964. Division of Fisheries, Ministry of Industry and Commerce, Quebec, Canada.

CANNING:

"Os corpos gordos na industria de conservas" (The oily substances in the canning industry), by G. Roskis, article, Conservas de Peixe, vol. 19, no. 224, Nov. 1964, pp. 15-19, 21, printed in Portuguese. Sociedade da Revista Conservas de Peixe, Lda., Regueirao dos Anjos, 68, Lisbon, Portugal.

CARP:

Carp Facts, by Leo Rock, Fish Mgt. Mimeo No. 17, 2 pp., processed, Aug. 1962. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

Selected Articles, by Jan Marian Wlodek, OTS 63-11403, 32 pp., printed, 1964, 50 cents. (Translated from the Polish, Acta Hydrobiologica, vol. 1, no. 1, 1959, pp. 5-16, 17-36.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Contains "Morphological characteristics of carp from Golysz pond farm," and "Studies on the body structure of Polish carp."

CHILE:

"Chile--atún y anchovetas" (Chile--tuna and anchovies), article, Pesca y Marina, vol. 16, no. 6, Dec. 1964-Jan. 1965, pp. 6-7, illus., printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

COASTAL WETLANDS:

Broad Marsh, by Robert F. Hutton, 6 pp., illus., printed. (Reprinted from Massachusetts Audubon, Winter 1964, pp. 65-70.) Division of Marine Fisheries, Mas-

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sachusetts Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass. In a historic decision of March 9, 1964, a Massachusetts Judge ruled that "Broad Marsh is a 'salt marsh' necessary to preserve and protect marine fisheries." Whatever the outcome of appeal, the decision stands as the first legal recognition of a biological fact: that salt marshes are related to the prosperity of marine fisheries. Some states have been trying to protect their wetlands and estuaries from destruction through educational and planning programs both at the state and local levels. Other states have introduced legislation directed toward that protection. In Massachusetts on May 22, 1963, Chapter 426 was passed by the Legislature of the Commonwealth and took effect immediately. This Act requires proper notification to local and state licensing agencies by petitioners seeking license to alter shoreline areas; the holding of a local hearing on each such proposed project; the evaluation of possible detriment to marine fishery resources and the imposing of appropriate conditions upon such projects by the Director of Marine Fisheries to protect adequately the fishery resources.

COBIA:

Spawning of the Cobia, RACHYCENTRON CANADUM, in the Chesapeake Bay Area, with Observations of Juvenile Specimens, by Edwin B. Joseph, John J. Norcross, and William H. Massmann, Contribution No. 157, 5 pp., illus., printed. (Reprinted from Chesapeake Science, vol. 5, no. 1-2, March-June 1964, pp. 67-71.) Virginia Institute of Marine Science, Gloucester Point, Va.

COD:

Research Concerning Cod in the Southern Part of Bornholm Basin in 1951-1952 (Badania nad Dorszem Południowej Części Basenu Bornholmskiego w Latach 1951-1952), by Czesław Zukowski, OTS 61-11366, 35 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, Prace Morskiego Instytutu Rybackiego w Gdyni, vol. 9, 1957, pp. 45-78.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Variation in abundance of polar cod of the Pomor coast of the White Sea," by A. M. Anukhina, article, Problemy Ispol'zovaniya Promyslovyykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, vol. I, 1963, pp. 112-119, printed in Russian. Problemy Ispol'zovaniya Promyslovyykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, Akademiia Nauk SSSR, Moscow, U.S.S.R.

COMMISSIONS:

(Atlantic States Marine Fisheries Commission) Minutes of the 23rd Annual Meeting (September 22-24, 1964, Atlantic City, N. J.), 189 pp., illus., processed, limited distribution. Atlantic States Marine Fisheries Commission, 336 E. College Ave., Tallahassee, Fla. 32301. Covers minutes of the 23rd annual meeting of the Commission with details of attendance; the first, second, third, and fourth general sessions; and section meetings of the North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections. Also includes accounts of the individual section meetings, resolutions recommended for adoption, and the executive committee and biological

committee meetings. Appendices contain, among others, reports on water pollution and commercial fisheries, Commercial Fisheries Research and Development Act of 1964, current problems and trends in the sanitary production of shellfish, fishery legislation of the 88th Congress, extent and effects of foreign fishing off the Atlantic Coast, menhaden investigations, and estuaries--the forgotten natural resource. Also contained in the appendices are reports on coastal alterations, technological research needs, hard clam size limits in various states and possibilities of a uniform size limit, and summer flounder research and recommendations for additional study.

COMPOSITION:

"Determination of sodium and potassium in fish and other marine products," by Mary H. Thompson, article, Journal of the Association of Official Agricultural Chemists, vol. 47, August 1964, pp. 701-707, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C. 10004.

CONSERVATION:

Federal Aid in Fish and Wildlife Restoration (Annual Report on Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1963), 82 pp., processed, 1964. Sport Fishing Institute, Bond Bldg., Washington, D. C. 20005. Presents a short program review of expenditures and projects operated during FY 1963, and statistical tables giving data on individual projects, land purchases, hunting and fishing licenses issued by the states, and other pertinent information.

CRABS:

Meat Content of King Crabs (PARALITHODES CAMTSCHATICA, Tilesius) from Kodiak Island, Alaska, by Guy C. Powell and Richard B. Nickerson, Informational Leaflet 46, 12 pp., processed, Jan. 10, 1965. Department of Fish and Game, Subport Bldg., Juneau, Alaska. To study periodic variation in meat content, 5 to 10 king crabs of similar length were selected each month from Oct. 16, 1961, to June 27, 1962, omitting only March and May. The total cooked meat of the three pairs of walking legs was extracted. The merus meat of the right middle walking leg was found to be a satisfactory index of total leg meat weight because of the high meat content and relative uniformity throughout the molt cycle. In another study, conducted during March 1960, the total cooked meat of the chelae, walking legs, body, and abdomen was removed from six juvenile king crabs and 16 adults of varying shell ages. The percentage of meat yield from juvenile crabs was less than that for adults. Newly molted crabs yielded a lower percentage of meat than crabs with 11-month old shells. The authors concluded that total commercial yield can be increased by harvesting crabs during seasons when meat content is high. They recommended that methods for determining meat yield be standardized.

CRUSTACEA:

Deoxyribonucleic Acids of Crustacea, by Michael Smith, 7 pp., illus., printed. (Reprinted from Journal of Molecular Biology, vol. 9, 1964, pp. 17-23.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

DIRECTORIES:

Conservation Directory, 1964-65--A Listing of Organizations, Agencies and Officials Concerned with Natural Resource Use and Management, 110 pp., processed, Sept. 1, 1964, \$1. National Wildlife Federation, 1412 16th St. NW., Washington, D. C. 20036. Includes names and addresses, together with other pertinent information, of United States Government agencies; independent U. S. Government agencies; international, national, and interstate commissions; international organizations; national organizations; regional organizations; colleges and universities; agencies and organizations in states and territories; Canadian Government agencies; Canadian national citizens' groups; and Canadian provincial and territorial agencies and citizens' groups.

World Fishing Guide, 1964 Edition, 189 pp., illus., printed in German, Spanish, and English, £3 (about US\$8.40). Grampian Press Ltd., The Tower, 229-243 Shepherd's Bush Rd., Hammersmith, London W6, England. The Guide is compiled to fulfill the need for a comprehensive directory of companies manufacturing gear, equipment, and supplies for the fishing industry. The manufacturers' directory is compiled under product headings. Under each heading, the name and address of companies manufacturing these items are given in full, by country. Companies in 21 countries are listed. A products index in the front of the book is provided, with reference numbers to the sections concerned. The fishing vessel builders' directory is devoted to listing shipyards in 17 countries engaged in vessel construction. Slipway and berth capacities together with the types of vessels built are specified and, where possible, names of designers are also given. A new section lists the fishing vessels completed in Europe and Canada in 1963, with details of propulsion machinery, fish detection and navigational equipment, and other features.

DRUM:

The Freshwater Drum, by Arnold Fritz, Fish Mgt. Memo No. 26, 2 pp., processed, Nov. 1963. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

The Pelagic Eggs and Early Larval Stages of the Black Drum from Chesapeake Bay, by Edwin B. Joseph, William H. Massmann, and John J. Norcross, Contribution No. 156, 10 pp., illus., printed. (Reprinted from Copeia, no. 2, June 30, 1964, pp. 425-434.) Virginia Institute of Marine Science, Gloucester Point, Va.

EAST GERMANY:

Fischerei-Forschung, vol. 2, no. 1, 1964, 138 pp., illus., printed in German. Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Democratic Republic of Germany. Includes, among others, articles on: "Erster bericht über kabeljau-markierungen 1961/62 bei Westgrönland" (The first report on 1961/62 cod tagging period in the area of western Greenland), by E. Biester; "Der einsatz von echographen in der fischereiforschung der kusten-fischerei" (The use of echographs in coastal fishery research), by K. Falk and W. Bobzin; "Ergebnisse von stromungstechnischen untersuchungen an netz-tuchern im windkanal" (The results of technical investigations on the trawl mesh resistance to current in a wind tunnel), by H. Stengel and H. J. Fischer; "Ergebnisse von stromungstechnischen untersuchun-

gen an schleppnetzmodellen im windkanal" (The results of technical investigations on resistance of trawl models in a wind tunnel), by H. Stengel and H. J. Fischer; "Ein messgerät zur bestimmung der netzöffnungshöhe--eine entwicklung vom institut für hochseefischerei und fischverarbeitung" (An apparatus for the determination of the height of net opening--a new development worked out by the Institut für Hochseefischerei und Fischverarbeitung), by H. Seiler; "Neue wege bei der gestaltung von booten für die kusten-fischerei" (New ways of building boats engaged in coastal fisheries), by H. Glanz; "Untersuchungen über den einfluss der standzeiten von 'fischkonserven' vor der sterilisation auf die qualität des endproduktes" (Research on the effects of pre-sterilization storage time on the quality of the end product), by G. Tschek; and "Untersuchungen über gefrierverfahren und schutz-massnahmen zur verlängerung der lagerfähigkeit von tiefgefrorenen sprotten und heringen" (Research on the procedures used in freezing and the measures adopted to prolong storage life of deep-frozen sprats and herring), by W. Gutschow.

ECHO-SOUNDER:

Echo Sounding Through Ice, by T. Hashimoto and others, Paper Presented at Second World Fishing Gear Congress, London, May 25-31, 1963, 6 pp., printed. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla.

EXPLOSIVES:

The Effect of Blasting on the Fish Population in Stagnant and Running Water, by J. Gennerich, Translation No. 610, 18 pp., printed. (Translated from the German, Zeitschrift für Fischerei, vol. 30, 1932, pp. 261-278.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

FILMS:

Films about the Canning Industry, 55 pp., illus., printed, fifth edition Dec. 1964. Information Division, National Canners Association, 1133 20th St. NW., Washington, D. C. 20036. Lists alphabetically by titles, with short descriptions and addresses of sources, films about the food and related industries. Includes, among films on many other foods, these on fishery products: "Fish Cookery with Savoir"; "It's the Maine Sardine"; "Salmon--Catch to Can"; "Shrimp Tips from New Orleans"; "Fresh Out of the Water"; "Chicken of the Sea" Tuna--from Catch to Can"; "Maine Sardines--the Food and the Industry"; "Sardines from Maine--Down-East Style"; "Shrimp Please"; and "Take a Can of Salmon."

FINLAND:

Foreign Trade Regulations of Finland, by Harold McNitt, OBR 64-132, 8 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Finland's commercial policy aims at a steady increase in the level of its international trade. In addition to trade policy, the report discusses the import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls,

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Finland's export controls, United States foreign trade controls, and Government representation between the two countries.

FISH BARRIERS:

"Erfahrungen mit elektro-fischabweisern" (Experiments with electrical fish barriers), by H. W. Hat-top, article, Deutsche Fischerei-Zeitung, vol. 11, no. 11, Nov. 1964, pp. 321-328, illus., printed in German. Neumann Verlag, Dr. Schmincke Alle 19, Radebeul 1, Berlin, Germany.

FISH BEHAVIOR:

"Dynamics of conditioned imitating reflexes in certain sea fishes (cod, coalfish, haddock)," by V. V. Gerasimov, article, Translation of Doklady Biological Sciences Sections, vol. 146, nos. 1-6, 1962, pp. 1106-1109, printed. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 146, no. 6, 1962, pp. 1456-1459.) Consultant's Bureau Enterprises, Inc., 227 W. 17th St., New York, N. Y. 10011.

"Izuchenie povedeniya ryb v zone deistviya orudii lova" (Fish behavior in the zone of action of fishing gear), by N. E. Aslanova, article, Trudy Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, vol. 36, 1958, pp. 33-51, printed in Russian. Trudy Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Verkh. Krasnosel'skaia Ul. No. 17, Moscow, U.S.S.R.

FISH COOKERY:

The Cookbook of the United Nations, compiled by Barbara Kraus, 146 pp., illus., printed, Oct. 24, 1964. United Nations Association of the United States of America, Inc., New York, N. Y. 10011. Contains 250 authentic recipes, professionally tested by home economists, from 112 countries. In addition to recipes for family meal dishes, there are large-scale buffet menus and recipes for receptions and other group meals. Fish dishes include baked fillets of whiting from Australia, baked fish a la Moscow from the U.S.S.R., Nigerian seafood and black-eyed peas, Belgian fillets of sole Ostendaise, fish soufflé from Iceland, fish stew with vegetables from Upper Volta, Malaysian shrimp with green pepper, New Zealand oyster stew, and many others.

FISHERY MANAGEMENT:

Fish Management Demonstrations, by Al Lopinot, Fish Mgt. Mimeo No. 15, 3 pp., processed, Aug. 1964. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

FISH FEEDING:

Availability of Food Animals to Some Fishes at Different Conditions of Illumination, by I. I. Girs, Translation No. 717, 5 pp., printed. (Translated from the Russian, Akademiya Nauk SSSR, Trudy Soveshchaniia Ikhtologicheskoi Komissii, no. 13, 1961, pp. 355-359.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

FISH FINDER:

Comparison between Survey Map by 14.5 kc. fish-finder and that by 200 kc. fish-finder with sharp beam

on same sea, by Tomiju Hashimoto and Yoshinobu Maniwa, OTS 60-13257, 7 pp., processed, \$1.10. (Translated from the Japanese, Technical Report of Fishing Boat, no. 12, 1958, pp. 149-155.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Gidroakusticheskii metod opredeleniya kolichestva ryb v razrezhenom skoplenni" (Hydroacoustic method of determining the quantity of fish at low population density), by O. N. Kiselev, M. D. Truskanov, and M. N. Shcherbino, article, Referativnyi Zhurnal-Biologiya, vol. 13, 1962, Abstract No. 13119, printed in Russian. Akademiya Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

FISHING WITH LIGHTS:

"Daylight lamps for fishing saury," by A. Kovalev, article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, p. 27, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

FISH-LIVER OIL:

The following articles from Chemical Abstracts, vol. 59, printed; American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Purification of fish liver oil," by Hiroshi Sone, Oct. 14, 1963, Abstract No. 8550b.

"The vitamin A potency of fish liver oil and its effect on the growth of albino rat. I--Growth tests on various diets," by H. Baba, Sept. 30, 1963, Abstract No. 7915c.

FISH MEAL:

"Nociones basicas acerca de la elaboracion de la harina de pescado" (Basic ideas about the manufacture of fish meal), by Trygve Sparre, article, Industria Conservera, vol. 30, no. 304, Oct. 1964, pp. 270-272, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

FISH PUMP:

"Experimental use of fish pumps in various phases of fisheries," by Shin'ichi Yajima and others, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 29, September 1963, pp. 834-840, printed in Japanese. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba Kaigandori 6, Minato-ku, Tokyo, Japan.

FISH SAUSAGE:

"Fish sausage and ham industry in Japan," by Eiichi Tanikawa, article, Advances in Food Research, vol. 12, 1963, pp. 367-424, illus., printed, Academic Press, 111 Fifth Ave., New York, N. Y. 10003.

FISH SCALES:

"A technique for preparing scale smears," by G. Power, article, Transactions of the American Fisheries Society, vol. 93, no. 2, 1964, pp. 201-202, printed, American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

FISH SOUNDS:

Noise of Creatures in Sea in Region of Ultrasound, by Tomiju Hashimoto and Yoshinobu Maniwa, OTS 60-19855, 16 pp., processed, \$1.60. (Translated from the

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Japanese, Technical Report of Fishing Boat, no. 12, 1958, pp. 99-114, Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

FISH SPOTTING:

Acoustic sounding for Fish from a Helicopter, by A. P. Golenchenko, 59-19172, 2 pp., microfilm, \$1.80. (Translated from the Russian, Priroda, vol. 47, no. 4, 1958, pp. 79-80.) Photoduplication Service, Library of Congress, Washington, D. C. 20540.

"La detección de peces con helicópteros" (Fish spotting with helicopters), by M. Yves Bourdreault, article, Pesca y Marina, vol. 16, no. 6, Dec. 1964-Jan. 1965, pp. 8-10, printed in Spanish, Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

"La localización de bancos de pesca con avión y sonar" (The location of fish schools with airplane and sonar), by Ragnar Hallre, article, Iberica, vol. 42, no. 29, Nov. 1964, p. 371, illus., printed in Spanish, single copy 18 ptas. (about 30 U. S. cents), Iberica, Palau, 3, Apartado 759, Barcelona-2, Spain.

FISH STOCKS:

Effect of Benthonic Fauna and Zooplankton on Fish Supplies, USSR, TT 64-41086, 22 pp., illus., processed, Aug. 10, 1964, \$1. (Translated from the Russian, Zoologicheskii Zhurnal, vol. 53, no. 6, 1964.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Oceanological conditions determining the size of the year classes of the most important commercial fishes in the northwestern North Atlantic," by A. A. Elizarov, article, Okeanologiya, vol. 3, no. 6, 1963, pp. 1065-1078, printed in Russian, Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.

FLORIDA:

Preliminary Exploratory Fishing on the Florida West Coast, by James E. Tyler, Special Scientific Report No. 8, 18 pp., illus., processed, Nov. 1, 1964. Marine Laboratory, Florida State Board of Conservation, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

FLOUNDER:

Structure of Catches of Flounder (PLEURONECTES FLESUS L.) in the Region of Gdansk in 1945-1952 (Skład Połowow Storni--Pleuronectes flesus L.--Rejonu Gdanskiego w Latach 1945-1952), by Zbigniew Reimann, OTS 61-11364, 54 pp., illus., processed, 1964. (Translated from the Polish, Prace Morskiego Instytutu Rybackiego w Gdyni, no. 9, 1957, pp. 103-150.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

FOOD AND AGRICULTURE ORGANIZATION:

From Food and Agriculture Organization, Viale delle Terme di Caracalla, Rome, Italy:

FAO Commodity Review, 1964, 287 pp., printed, 1964. This is one in a series of annual commodity reviews and is divided into three parts. Part I contains a summary of developments in international commodity markets during 1963 and early 1964 and of inter-

national agreements and commodity consultations. Part II is a brief account of the United Nations Conference on Trade and Development, Geneva, March-June 1964. Part III analyses the current situation and outlook for all major agricultural, fishery, and forest products. In 1963, although no spectacular increases were recorded in catches of the leading fishery nations, world fish production probably set a new record of nearly 50 million tons.

Provisional Report of the Forty-Third Session of the Council, 91 pp., processed, Oct. 28, 1964. Presents an account of proceedings and discussions of the 43rd session of the Council of the Food and Agriculture Organization (FAO) held at Rome, Oct. 5-16, 1964. Topics covered include the world food and agriculture situation, activities of the FAO, world food program, constitutional and legal questions, administrative and financial questions, appointments, and other matters such as applications for membership. Included among many other detailed reports were those on activities of the FAO Fisheries Division, the role of FAO in world fishery development, and a plan for rational development of tuna resources in the Atlantic Ocean. "Many delegates considered that the status of the (Fisheries) Division within the Organization should be elevated and some suggested that this might take the form of giving it the status of a department," states one section.

Available from Columbia University Press, International Documents Service, 2960 Broadway, New York, N. Y. 10027:

General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, No. 7, 508 pp., illus., printed, 1964, \$10. Part I contains a list of the participants and a summary record of the plenary sessions of the seventh session of the GFCM, Madrid, March 12-18, 1963. Included is a report of the work programs and recommendations and resolutions of the marine resources, production, utilization, inland waters, and economics and statistics committees. Part II consists of the texts of the technical papers presented in addition to lists of the papers in numerical order and in alphabetical order of authors.

Report of the Twelfth Session of the Conference, 16 November-5 December 1963, 209 pp., printed, 1964, \$3. Included are specific sections dealing with the fishery activities of the organization.

The State of Food and Agriculture, 1964, CL 43/4, 248 pp., illus., printed, 1964, \$6. Included is a section on fishery production.

FOREIGN TRADE:

"10th general revision of export regulations," Federal Register, vol. 30, no. 25, Feb. 6, 1965, part II, section 1, pp. 1402-1509; section 2, pp. 1512-1716, printed. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230. Primary purpose of the 10th revision of Subchapter B--Export Regulations, Title 15--Commerce and Foreign Trade, is to consolidate into a new Commodity Control List the export controls which are applicable to all commodities to all destinations. Section 1 covers mutual assistance on U. S. imports and exports (as applied to selected U. S. imports); scope of export control by Department of Commerce; general

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licenses; provisions for individual and other validated licenses; licensing policies and related special provisions; project license; blanket license (BLT); periodic requirements license (PRL); and timelimit license (TL). It also contains information on export clearance and destination control; amendments, extensions, transfers; enforcement provisions; denial of export privileges; administrative reviews and appeals; general orders; exportation of technical data; and priority ratings. Section 2 covers the commodity control list, commodity interpretations, and licensing division jurisdiction over processing codes. Fish and fish preparations are among the commodities covered in this section.

"Worldwide import rules," article, International Commerce, vol. 71, no. 4, Jan. 25, 1965, pp. 6-10, printed, single copy 35 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) License and exchange-permit requirements as of Jan. 1, 1965, of about 119 countries are summarized for United States exporters in this article. Many countries which require import licenses for commercial shipments permit unlicensed imports of commercial samples and advertising matter of no monetary value. However, a number of countries require no import license or exchange permit at all for importation of commodities.

FRANCE:

Foreign Trade Regulations of France, by William Nagel, OBR 64-136, 11 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) France's trade policy in recent years has been directed toward expansion of exports, liberalization of imports, and simplification of foreign exchange controls. The report explains France's import tariff system, sales and other internal taxes, shipping documents, labeling and marking requirements, and special customs provisions. Also covers non-tariff import controls, France's export controls, United States foreign trade controls, and Government representation between the two countries.

"La production pesquera francesa ascendió a 507,000 toneladas en 1963" (French fishery production rose to 507,000 metric tons in 1963), article, Boletín de Informacion, no. 72, September 1964, pp. 19-21, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

The following articles are from La Pêche Maritime, printed in French; La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France:

Vol. 43, no. 1041, Dec. 1964 (single copy 22.5 F or about US\$4.55):

"La pêche Française a l'heure communautaire" (The French fishery in the Common Market), by Huguette Rozes, pp. 871-875, illus. Discusses the current position of the French fisheries under the European Common Market, imports and exports of fishery products, elimination of duties and quantitative im-

port restrictions among the member countries, and economic and political impact on the fisheries.

"Quelques raisons d'espérer" (Some reasons to hope), by E. Derouin, pp. 876-878, illus. Discusses a number of reasons for expecting improvement in the French fisheries during 1965.

Vol. 44, no. 1042 (single copy 14 F or about US\$2.85):

"Coup d'oeil sur l'évolution de la pêche en 1964" (A look at fishery developments in 1964), by L. Plouas, pp. 7, 8.

FREEZE-DRYING:

The following reports are available free from the Division of Information, OMS, U. S. Department of Agriculture, Washington, D. C. 20250.:

The Awakening Freeze-Drying Industry, by Kermit Bird, 13 pp., illus., processed, Jan. 1965. Discusses the present status of the industry; future aspects of freeze-drying, based on products being developed or market-tested such as coffee, tea, fruits, shrimp and crab, and ice cream; comparison of freeze-drying's growth with several new frozen products; whether freeze-drying will hurt the freezing industry; and a summary of growth prospects. Included are statistical tables showing United States and Canadian firms freeze-drying food for commercial market, January 1965; growth of commercial frozen foods, 1939-62; a graph showing anticipated growth of the freeze-drying industry, 1962-70; and other data.

Freeze-Drying Attitudes (Contains the 1964 Directory of Freeze-Drying), by Kermit Bird, 20 pp., processed, Nov. 1964. Covers the background of freeze-drying of foods during World War II and in Europe; markets for freeze-dried foods such as the armed forces, institutions, and the export trade; how misinformed attitudes toward these products limit their growth; and the need for exchange of information on this process. Included is a directory of freeze-dried food processors, handlers, equipment manufacturers, equipment firms, consultants, and others in North America, Europe, and the rest of the world.

FREEZERSHIP:

Modern Freezing and Refrigerating Installations for Fishing Vessels, by E. Hofman, GB/17/1540, 1 p., printed. (Translated from the German, Hansa, vol. 99, no. 18, 1962, p. 1869.) Association of Special Libraries and Information Bureau, 3 Belgrave Sq., London SW1, England.

FREEZING:

Freezing Meats, Poultry, Eggs, Dairy Products and Fish, by Jewel Graham, HE 60, 12 pp., illus., printed, May 1964. Cooperative Extension Service, Iowa State University, Ames, Iowa. Presents information on advantages of freezing; how to use a freezer most efficiently; how much, what kind, when to buy, and how long to store foods; and how to select and freeze meat, lard, poultry, and dairy products. A section on freezing fish covers cutting, handling of lean and fatty fish, wrapping, glazing, handling of shellfish, and cooking frozen fish. Emphasis is placed on the importance of freezing and maintaining the storage temperature of foods at 0° F.

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FRESH-WATER FISH:

The Affinities and Derivation of the New Zealand Fresh-Water Fish Fauna, by R. M. McDowall, 9 pp., illus., printed. (Reprinted from Tuatara, vol. 12, no. 2, July 1964, pp. 59-67.) Fisheries Laboratory, Marine Department, Wellington, New Zealand.

Familiar Fresh-Water Fish (Picture-Story Study Print Set), by R. E. Eshmeier, set SP 116, 8 color prints, 1964, sold only in sets at \$8 a set (\$7 a set when 6 or more sets are ordered at one time), Society for Visual Education, Inc., 1345 Diversey Parkway, Chicago, Ill. 60614. This set contains eight 13 x 18 inch full-color photo prints of 11 fresh-water fish--yellow perch, northern pike, brown bullhead, largemouth bass, brook trout, carp, common shiner, bluegill, rock bass, pumpkinseed, and black crappie (the last four on one print). On the back of each print is information on the species pictured, together with a diagram showing parts of a fish, general facts about fish, and lists of filmstrips and other study print sets available from the publisher. Each set consists of eight photos, printed on heavy stock and coated with a protective finish; complete lesson material appears on the reverse of each print. They are especially suitable for display, as die-punched holes at the corners permit thumbtack posting without damage to the print. A durable "picture window" display-storage portfolio is provided with each set at no additional charge.

FROZEN FISH:

"Frozen fish, Britain," by H. G. Garland, article, Foreign Trade, vol. 123, no. 3, Feb. 6, 1965, pp. 27-28, printed, single copy 25 Canadian cents. Queen's Printer, Government Printing Bureau, Ottawa, Canada. Nearly three-fourths of the fish consumed in Great Britain is sold fresh, but retail packs of frozen fish are now taking an increasing share of the market. Sales of frozen fish products accounted for about one-third of the £75 million (about US\$210 million) spent on frozen foods during 1964 and have increased faster than the sales of other products in the industry. Imports from many countries help to make up the wide variety of packs that stock frozen-food cabinets. Fish sticks are by far the largest selling item but there is a greater choice of brands and sizes of cod, haddock, and plaice fillets. Several brands of kippers, still the breakfast standby in many British households, are sold buttered and boned, and some are available in the "boil-in-the-bag" pack. Competition is keen and is likely to be intensified by a recent merger of three leading companies in the frozen-food industry, one of which is particularly strong in fish products.

"Protein denaturation in frozen fish. VIII--The temperature of maximum denaturation in cod," by R. M. Love and M. K. Elerian, article, Journal of the Science of Food and Agriculture, vol. 15, no. 11, Nov. 1964, pp. 805-809, illus., printed, single copy £1 17s. 6d. (about US\$5.30). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

The Thawing of Blocks of Small Fish, by S. I. Gakichov and V. D. Borodin, OTS 62-13735, printed, \$2.60. (Translated from the Russian, Gostorgizdat, Moscow, U.S.S.R., 1959.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

GERMAN FEDERAL REPUBLIC:

Informationen für die Fischwirtschaft, vol. 11, no. 5, 1964, 49 pp., illus., processed in German. Bundesforschungsanstalt für Fischerei, Palmaile 9, Hamburg-Altona 1, Federal Republic of Germany. Includes, among others, these articles: "Tagung der Int. Group for Pelagic Fishing Methods (IF) in Hamburg am 19 u. 20 Okt. 1964" (Meeting of the Group for Pelagic Fishing Methods in Hamburg, 19-20 Oct. 1964); "Forschungsreise des FFS Anton Dohrn in die Norwegischen Gewässer, zur Bäreninsel und zur Skolpenbank vom 12.10-9.11.1964" (Research cruise of the RV Anton Dohrn in Norwegian waters between Oct. 12-Nov. 9, 1964), by H. H. Reinsch; "Forschungsreise mit FFS Walther Herwig, 21.9 bis 14.10.1964, SW-Nordsee, Skagerrak, Ostkante" (Research cruise with RV Walther Herwig, Sept. 21 through Oct. 14, 1964, southwest North Sea, Skagerrak, Ostkante), by J. Scharfe and H. Mohr; "Versuche über 'seelachs in öl' -konservierung" (Experiments on sea salmon in oil preservation), by F. Gehring; "Qualitätsvorschriften für tiefgefrorene Produkte in Frankreich" (Quality norms for deep-frozen products in France), by H. Brockstedt; and "D.L.G. - Leistungsprüfung für tiefgefrorene fische und fischerzeugnisse" (Tests for deep-frozen fish and fishery products), by N. Anton-acopoulos.

Jahresbericht über die Deutsche Fischwirtschaft, 1963/64 (Annual Report on the German Fisheries, 1963/64), issued by the Federal Ministry of Food, Agriculture and Forestry in cooperation with the Federal Statistical Office, 296 pp., illus., printed in German with English table of contents and chapter summaries, Oct. 1964. (Available from Verlag Gebr. Mann, Hauptstrasse 26, Berlin 62, Germany.) A review covering all phases of the German fisheries in 1963/64. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply, the German fishing fleet, biological-statistical report on the German deep-sea fishery, and foreign trade in fishery products. Part II includes information on cruises of the fishery protection and fishery research vessels, the fishing industry and the Social Security Board for Seamen, work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the cutter deep sea and coastal fisheries, fresh-water fisheries, the fish meal and oil industry, and the market for salt-water fishery products in the Federal Republic of Germany. Part IV gives data on foreign fisheries.

GREAT LAKES:

"Collection and analysis of commercial fishery statistics in the Great Lakes," by Ralph Hile, article, Great Lakes Fishery Commission Technical Report, No. 5, 1962, pp. 1-31, printed. Great Lakes Fishery Commission, Natural Resources Bldg., University of Michigan, Ann Arbor, Mich.

HADDOCK:

Yearly Fluctuations in the Food of Haddock off the Murman Coast (k Voprosu o Ezhegodnykh Kolebaniyakh Pitaniya Pikshi Murmanskogo Poberezh'ya), by R. Ya. Tseeb, OTS 63-11124, 17 pp., illus., processed, 1964, 50 cents. (Translated from the Russian, Trudy Murmanskogo Morskogo Biologicheskogo Instituta Akademii Nauk SSSR, no. 2 (6), 1960, pp. 186-202.) Office

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

HERRING:

Clupeidae (Sel'devye), by Anatolii N. Svetovidov, 432 pp., illus., printed, 1963. (Translated from the Russian.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

"Fishery for the Pribilof winter herring," article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, pp. 14-15, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

Growth of the Otoliths of Young Herring, by G. Hempel, Translation 613, 18 pp., printed. (Translated from the German, Helgolander Wissenschaftliche Meeresuntersuchungen, vol. 6, pt. 3, 1959, pp. 241-258.) Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

"Review and emendation of: Family Clupeidae," by Samuel F. Hildebrand, article, Fishes of the Western North Atlantic, Memoir I, Part 3, pp. 257-454, illus., printed, Mar. 1, 1964, \$27.50. Sears Foundation for Marine Research, New Haven, Conn.

"Storsildundersøkelsene i Nord-Norge 1964" (Investigation of the large herring in Northern Norway in 1964), by Finn Devold, article, Fiskets Gang, vol. 50, no. 51, Dec. 17, 1964, pp. 754-757, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

The following articles are from Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoevov Karelii, vol. 1, 1963. Akademiya Nauk SSSR, Moscow, U.S.S.R.

"Annual variations in the conditions and effectiveness of spawning and their influence on the size of the year classes of the White Sea herring," by K. A. Altukhov, pp. 57-68.

"Distribution of the herring of the White Sea," by Yu. E. Lapin and others, pp. 75-80.

"Morphological-ecological peculiarities in the development of the White Sea herring (Clupea harengus Pallas natio maris-albi Berg)," by S. G. Soin, pp. 68-74.

"Seasonal variations in the food of the White Sea herring," by R. Ya. Margulis, pp. 104-107.

"Similarities and differences in the biological tribes of herring in Onega Bay of the White Sea," by V. M. Erastova, pp. 81-86.

"Similarities in the variations of abundance of the spring-spawning herrings of Northwestern Europe, the Baltic, Atlanto-Scandinavian, and White Sea herrings," by I. I. Nikolaev, pp. 87-97.

"State of the natural resources and the prospects for 1962 herring fishing in the northwestern part of the White Sea," by B. M. Tambovtsev, pp. 53-56.

"Zooplankton of the White Sea and its importance as food for the herring," by L. M. Epshtein, pp. 98-104.

ICELAND:

"Icelandic fishing vessels. Part One," by Hjalmar K. Bardarson, article, Iceland Review, vol. 2, no. 4, 1964, pp. 29, 31-33, 35-36, illus., printed, single copy Kr. 50 (about US\$1.15). Iceland Review, P.O.B. 1238, Reykjavik, Iceland. As of Jan. 1, 1964, Iceland's fishing fleet of 859 vessels amounted to 75,171 gross registered tons, or more than half the total of 145,000 tons for all vessels. When the vikings first came to Iceland in the 9th century, they brought with them their vessels and the skills necessary to build and operate them. Today, oak plank fishing vessels of up to 200 tons are still being constructed in Iceland. Most vessels constructed in Icelandic yards are of wood. All those vessels are built in accordance with the Icelandic regulations. However, during the last 10 years the number of steel fishing vessels has been increasing very rapidly as compared with the wooden ones. The first steel vessels registered in Iceland were steam trawlers bought from England in 1905. Fewer deep-sea trawlers have been constructed recently for Icelandic owners in recent years. Final rules have not yet been drawn up for the construction of steel vessels. The brisk building program of combination vessels of between 100-300 tons is due mainly to the development in Iceland of new herring fishing techniques, using the hydraulic power block from a special crane above the boatdeck on which the net is placed, together with the increasing use of asdic equipment for locating submerged herring shoals.

ILLINOIS:

Fish Management Program of the Illinois Department of Conservation, by Al Lopinot, Fish Mgt. Memo No. 14, 2 pp., processed, Oct. 1961, Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

INDIAN OCEAN:

Brief Review of the Activities of the Second Indian Ocean Expedition of the Azov-Black Sea Fisheries Scientific Institute, by B. S. Solov'ev, OTS 64-21652, 3 pp., processed, 1964. (Translated from the Russian, Okeanologiya, vol. 3, no. 5, 1963, pp. 936-938.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Studies of the Indian Ocean during the 35th Cruise of R/V "Vityaz", by P. L. Bezrukov, JPRS 23281, 10 pp., processed. (Translated from the Russian, Okeanologiya, vol. 3, no. 3, 1963, pp. 540-549.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

INDUSTRIAL PRODUCTS:

"Cuando habla el ingenio" (When the talented person speaks), article, Mundo Pesquero, vol. 2, no. 15, Nov. 1964, pp. 16-17, illus., printed in Spanish, single copy S/. 6.00 (about 25 U. S. cents). Mundo Pesquero, Av. Oscar R. Benavides 1207 (Colonial), Lima, Peru. Discusses how technologists can recommend methods and procedures in the fish meal and oil industry for reducing costs of production and improving product quality.

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INTERNATIONAL COMMISSIONS:

Available from International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, Dartmouth, N. S., Canada:

International Commission for the Northwest Atlantic Fisheries, Annual Proceedings for the Year 1963-64, vol. 14, 43 pp., printed, 1964. Presents an account of the activities of the Commission's Secretariat during the year ending June 30, 1964, including financial statements; a report of the Fourteenth Annual Meeting held June 1-6, 1964, in Hamburg, Federal Republic of Germany; and summaries of research in the Northwest Atlantic during 1963 by subareas, including work carried out by member countries, hydrography and plankton reports, stocks of cod, ocean perch, and other fish, and commercial fishing.

International Commission for the Northwest Atlantic Fisheries, Redbook 1964. Part II--Research Reports by Member Countries; Part III--Selected Papers from the 1964 Annual Meeting, 150 pp., illus., processed, Nov. 1964, limited distribution. Part II contains reports on research in the ICNAF area in 1963 by Canadian, Danish, German, Icelandic, Norwegian, Polish, Portuguese, Spanish, United Kingdom, U.S.S.R., and United States groups. The report by each country group discusses the subareas commonly fished by its vessels; and presents information on the status of the fisheries and, frequently, on environmental and biological studies. Part III includes papers on: "The selectivity of a flap-type topside chafer," by R. J. H. Beverton; "Review of tagging publicity methods used by ICNAF member countries," by S. A. Horsted; and "Minimum mesh sizes and equivalents for different materials to meet ICNAF regulations," by F. D. McCracken.

International Commission for the Northwest Atlantic Fisheries, Research Bulletin, No. 1, 1964, 111 pp., illus., printed. This issue is the first of a new annual series intended to provide a means of publishing regularly the results of individual research relevant to the International Commission for the Northwest Atlantic Fisheries. Included are articles on: "Landings, fishing effort, and apparent abundance in the yellowtail flounder fishery," by Fred E. Lux; "1963 cod otolith exchange," by A. C. Kohler; "The effect of catch size on the selectivity of otter trawls," by V. M. Hodder and A. W. May; "Electronic flash photography of Gadoid otoliths," by R. W. Blacker; "Redfish above the ocean depths," by G. P. Zakharov; "Abundance, age composition of landings, and total mortality of haddock caught off southern Nova Scotia, 1956-1961," by R. C. Hennemuth, M. D. Groslein, and F. D. McCracken; "Discrepancies between auto-lab and N. I. O. salinometers," by R. A. Cox and A. R. Folkard; "Two mechanical aids for otolith reading," by B. C. Bedford; "A method of preparing photographs and transparencies of cod otoliths," by J. Messtorff; "Hydrographic conditions off the coasts of Labrador and Newfoundland in November-December 1962," by J. W. Ramster; "Estimating the natural mortality rate of the sea scallop (*Placopecten magellanicus*)," by Arthur S. Merrill and J. A. Posgay; and "Adult redfish in the open ocean," by G. T. D. Henderson and D. H. Jones.

(International North Pacific Fisheries Commission) Annual Report, 1963, 173 pp., illus., printed, 1964. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada. This is the tenth consecutive annual report of the International North Pacific Fisheries Commission, established by a Convention between Canada, Japan, and the United States on June 12, 1953, for the purpose of promoting and coordinating the necessary scientific studies and to recommend the required conservation measures in order to secure the maximum sustained productivity of fisheries of joint interest. The report contains summary accounts of the annual meeting of the Commission held in Tokyo, Nov. 18-23, 1963, of an informal meeting, Oct. 4, 1963, and of an interim meeting held in Tokyo, Feb. 5, 1963; and a brief resume of administrative activities during the year. It also presents summaries prepared by the three national research agencies of investigations which they carried out under the planning and coordination of the Commission. Of principal concern are the salmon, halibut, herring, and king crab fisheries.

(North Pacific Fur Seal Commission) Proceedings of the Seventh Annual Meeting, February 24-27, 1964, Moscow, U.S.S.R., 28 pp., processed, Dec. 1964. Secretary, North Pacific Fur Seal Commission, U. S. Fish and Wildlife Service, Washington, D. C. 20240. The North Pacific Fur Seal Commission was established in January 1958, during a meeting held in Washington, D. C. The Commission was organized pursuant to the Interim Convention on Conservation of North Pacific Fur Seals, signed by the Governments of Canada, Japan, the U.S.S.R., and the United States in Washington, D. C., on February 9, 1957. The Convention came into force on October 14, 1957. This report contains a summary of the Seventh Annual Meeting, a report of the Standing Scientific Committee, a list of participants at the meeting, and the administrative report of the Secretary to the Seventh Meeting.

IRAQ:

Foreign Trade Regulations of Iraq, by Jackson B. Hearn, OBR 64-131, 8 pp., printed, December 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Iraq's trade policy is designed to protect domestic industry, provide commodities considered essential to the domestic economy, limit imports of less essential items, control prices, and increase the share of Iraqi nationals in the country's trade. In addition to trade policy, the report discusses the import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import controls, Iraq's export controls, United States foreign trade controls, and Government representation between the two countries.

IRRADIATION PRESERVATION:

Irradiation Preservation of Fresh-Water Fish and Inland Fruits and Vegetables, by John A. Emerson and others, Report No. COO 1283-12, 86 pp., printed, August 1964. U. S. Atomic Energy Commission, Washington, D. C. 20545.

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Articles, *Food Technology*, vol. 18, June 1964, printed; Garrard Press, 510 N. Hickory, Champaign, Ill.:

"Irradiation preservation of Pacific Coast shellfish. I--Storage life of king crab meats at 33° and 42° F.; II--Relation of bacterial counts, trimethylamine and total volatile base to sensory evaluation of irradiated king crab meat," by D. Miyauchi and others, pp. 138-147.

"Preservation of fresh unfrozen fishery products by low-level radiation. Parts I, II, III," by Richard O. Brooke and others, pp. 112-120.

ITALY:

Foreign Trade Regulations of Italy, by Fernand Lavallee, OBR 64-139, 8 pp., printed, December 1964. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Italian Government includes an export promotion program in its broad economic planning and concurrently encourages imports as a means of providing necessary foodstuffs, raw materials, and industrial equipment to keep domestic prices down or enlarge and modernize the country's manufacturing facilities. In addition to trade policy, the report discusses Italy's import tariff system, sales and other internal taxes, shipping documents, and labeling and marking requirements. It also covers special customs provisions, nontariff import controls, Italy's export controls, United States foreign trade controls, and Government representation between that country and the United States.

"El mercado Italiano de conservas de pescado" (The Italian canned fish market), article, *Industria Conservera*, vol. 30, no. 302, Aug. 1964, p. 209, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

JAPAN:

"Oceanography in Japan," by O. V. Kol'man, article, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 559-564, printed in Russian. *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

LABELING:

National Association of Frozen Food Packers Program of Labeling Practices for Labeling in the Consumer Benefit, 183 pp., illus., processed, 1964, price available from publisher. National Association of Frozen Food Packers, 919 18th St. NW., Washington, D. C. 20006. The manual presents a program for uniform and consistent placement of required information and helpful guidelines on voluntary labeling matters concerning frozen foods that reflect good commercial practice. It calls for the placement of essential and helpful information on three consecutive panels of the package so that the shopper will always know where to find the information she seeks. They are designated as: (1) The Shopper's Panel (main display panel) which is to carry the product name, net quantity, and name of packer or distributor, plus informative terms about the style, size, tenderness, variety, quality, and kitchen-ease of the product (ready to cook, pre-

cooked, prebaked); (2) The Composition Panel (front riser panel) where the statement of ingredients is to be made; and (3) The Family Panel (bottom of package) where helpful information is to be presented on handling the product, opening the package, cooking or preparing the product, innovations for serving, number of servings, and nutritional quality. The manual, containing labeling profiles for more than 200 kinds and styles of frozen foods, is presented in looseleaf form in order to allow the inclusion of additional and substitute materials as the occasion may arise. Labeling profiles for frozen fishery products will be added later.

LAKE ERIE:

Lake Erie Sport Fishing Survey, by Myrl Keller, Publication W-316, 19 pp., printed, 1962. Division of Wildlife, Ohio Department of Natural Resources, Columbus, Ohio.

LINGCOD:

Denaturation of Adenine and Related Compounds and Formation of Deoxyadenosine and Deoxyinosine by Lingcod Muscle Enzymes, by H. L. A. Tarr and A. G. Comer, FRB Studies No. 894, 7 pp., printed, (Reprinted from *Canadian Journal of Biochemistry*, vol. 42, 1964, pp. 1527-1533.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

LOBSTER:

Contribuicao para o Conhecimento da Pesca e da Biologia do Lagostim (NEPHROPS NORVEGICUS L.) na Costa Portuguesa (Contribution to the Knowledge of the Fishery and the Biology of the Norway Lobster--*Nephrops norvegicus* L.--off the Portuguese Coast), by Maria Jose de Figueiredo and Ivone Ferreira Barraca, Notas e Estudos do Instituto de Biologia Maritima No. 28, 44 pp., illus., printed in Portuguese with English summary. Instituto de Biologia Maritima, Lisbon, Portugal.

MACKEREL:

"O svyazi raspredeleniya i pitaniya skumbrii v severo-zapadnoi chasti Chernogo morya" (Relationship between distribution and feeding of mackerel in the northwestern part of the Black Sea), by A. V. Krotov, article, *Referativnii Zhurnal-Biologiya*, 1963, Abstract No. 17127, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.

MARKETING:

Seafood Merchandising--A Guide for Training Programs, OE-82014, 77 pp., illus., printed, 1964, 30 cents. Office of Education, U. S. Department of Health, Education, and Welfare, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This bulletin suggests guidelines for the promotion and organization of training programs that will aid in the orderly flow of fishery products to the consumer. Chapter I, the seafood industry and its problems, discusses distribution channels, marketing problems, and need for education. Chapter II, organizing and operating a seafood merchandising program, covers briefly elements in the program, the coordinator, enlisting leaders, organizing the course, financial arrangements, personnel, materials, promotion, teaching approach and methods, course eval-

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uation, and other topics. Chapter III, curriculums for seafood merchandising training courses, outlines 9 different courses in retail seafood business for management and supervisory level personnel, operational level personnel, and for wholesaling, consumer educators, and mass feeders. Chapter IV, a sample seafood merchandising course, offers educational material on general fisheries information, product information, promotional activities for the seafood industry and seafood department, principles of salesmanship, and operating a seafood business. It also presents information on supervisory techniques; economics of seafood merchandising; nutritional value, preparation, and cooking of seafood; trends in seafood and its merchandising; and Government role in seafood merchandising.

MASSACHUSETTS:

From Division of Marine Fisheries, Massachusetts Department of Natural Resources, 15 Ashburton Pl., Boston 8, Mass.:

Annual Report, Fiscal Year July 1, 1963-June 30, 1964,

149 pp., illus., processed, Sept. 1, 1964. Discusses accomplishments of the Division of Marine Fisheries during the year ending June 30, 1964. Covers Marine Fisheries Advisory Commission meetings during 1964, lobster research and management, shellfish research and management, estuarine research program, appraisal and control of coastal alterations and marine engineering projects, finfish studies, and legislative studies. Includes statistical tables showing data on the lobster fishery; sea crab fishery; shore, net, and pound fishery, and Massachusetts fishery products landings. The appendixes contain information on a proposal for lobster research, the Federal Commercial Fisheries Research and Development Act of 1964, the proposed laboratory for Cat Cove, Salem, Mass., blackback flounder tagging data, and other subjects.

Report of the Department of Natural Resources Relative to the Coastal Wetlands in the Commonwealth, under Chapter 15 of the Resolves of 1963, Senate No. 855, 77 pp., illus., printed, Jan. 1964.

From Massachusetts Department of Commerce & Development, 150 Causeway St., Boston 14, Mass.:

Commercial Fishing--A Harvest of the Sea, 17 pp., illus., printed, 31 cents. Presents "a new look at Massachusetts' oldest industry." Describes the history of her fisheries from the time of the Pilgrims to the present day; the fishing grounds of Nantucket, Gulf of Maine, the Grand Banks, Georges Bank, and distant parts of the world frequented by her fishermen; the fishery resources of the State's waters; employment of 4,000 fishermen and 3,200 people in the processing industries; and economic importance of the fisheries. Also explains the gear used--otter trawls, purse seines, line trawls, and drift nets; the lobster fishery and its value; the scallop fishery and its principal port of New Bedford; modernization of vessels; and the promising future of her fisheries. Included are several recipes for cooking fish and shellfish--fillet of sole Amandine, scallop salad, fish chowder, baked had-dock, scallops and rice, cod bean bake, fried ocean perch fillet, and ocean perch Amandine.

Massachusetts Salt Water Fishing Guide, 65 pp., illus., printed, 1964.

MEDITERRANEAN SEA:

"Conference on the study of the Mediterranean" (Oct. 1962), by L. M. Fomin article, *Okeanologiya*, vol. 3, no. 1, 1963, pp. 177-178, printed in Russian, *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

The Fourth Mediterranean Expedition of R/V "Akademik S. Savilov," by Yu. E. Ochakovskii, JPRS 23281, 5 pp., processed. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 550-554.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

MEXICO:

Foreign Trade Regulations of Mexico, by Walter Haidar, OBR 64-128, 8 pp., printed, December 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Mexico's trade policy emphasizes industrialization. Its industries and internal consumer markets are protected by high tariffs and by import controls. The report discusses Mexico's import tariff system, sales and similar internal taxes, documentation and fees, labeling requirements, and special customs provisions. Also covers nontariff import controls, Mexico's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

NAVIGATION AIDS:

"The first drifting radio-buoys," by Ya. Ya. Gakkal and L. P. Samsoniya, article, *Deep-Sea Research*, vol. 9, Nov./Dec. 1962, pp. 538-546, printed. (Translated from the Russian, *Okeanologiya*, vol. 1, no. 4, 1961, pp. 691-700.) Pergamon Press, 122 E. 55th St., New York, N. Y. 10022.

NETHERLANDS:

Selling in the Netherlands, by Jacobus T. Severiens, OBR 64-133, 16 pp., printed, December 1964, 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Netherlands is an important customer of the United States, and excellent possibilities exist for expanding sales of many American products. The report explains the road to selling--import channels and requirements; industrial property rights; distribution practices; and transportation, port, and storage facilities. Also covers commercial practices, marketing aids, Netherlands Government procurement, United States export credit insurance and guarantees, and notes for business travelers on entrance requirements and living costs and conditions.

NETS:

"An inexpensive adaptation for plankton nets," by John W. Foerster, article, *Turtlox News*, vol. 42, no. 1, 1964, pp. 22-23, printed. General Biological Supply House, Inc., 8200 S. Hoynes Ave., Chicago, Ill.

NEW ZEALAND:

Report on Fisheries for 1963, 25 pp., printed, 1964. Marine Department, Wellington, New Zealand. Dis-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

cusses total New Zealand landings by class and by year, 1946-63; spiny lobster landings, 1954-63; fishing vessels and personnel; fish landings by species, 1962-63; methods of capture; landings at ports; foreign trade in fish and shellfish; sport fishing; fish-liver oil production; whaling, 1963 season; rock and dredged oysters; and production of toheroas (edible mollusc). Also covers whitebait fishing; mussel production; angling licenses; research and investigation--research vessel operations, grid-patterned trawling, marine fish studies, marine mammal projects, shellfish studies, survey of fishing grounds, trout fisheries, Quinall salmon, use of insecticides, and lake eutrophication and weed growth studies. Activities of the Fishing Industry Advisory Council, Freshwater Fisheries Advisory Council, and Fishing Industry Board; and legislation affecting fisheries are reported. Includes statistical tables on the number of fishing vessels and fishermen by port or district and method of fishing; quantity of fish and shellfish landed by port; quantity of fish landed by species and type of gear; landings by species and port; landings of fish and spiny lobsters by ports and months; and foreign trade in fishery products.

NORTH AMERICA:

The Book of Fishes; the Better-Known Food and Game Fishes and the Aquatic Life of the Coastal and Inland Waters of North America, edited by John Oliver La Gorce, 350 pp., illus., printed, 1961. The National Geographic Society, 17th and M Sts. NW., Washington, D. C.

NORTH PACIFIC OCEAN:

Oceanological Studies in the North Pacific, by D. E. Gershanovich, JPRS 24313, 5 pp., processed. (Translated from the Russian, Okeanologiya, vol. 3, no. 6, pp. 1119-1123.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

NORTHWEST ATLANTIC OCEAN:

Fishes of the Western North Atlantic, Part 3, 597 pp., illus., printed, 1964, \$27.50. Sears Foundation for Marine Research, Bingham Oceanographic Laboratory, Yale University, New Haven, Conn. This volume includes studies of nearly 100 species in 35 genera of "bony fishes." In addition to the descriptive details and discussion of orders, suborders, families, genera, and species, the key and synopses relate distinguishing characteristics that aid identification. Details, aside from the description of the species itself include color, size, development, habitat, general habits, food, parasites, predators, sporting qualities, range, abundance, and commercial importance. Some of the species covered are salmon, trout, tarpon, char, anchovies, and herring.

NORWAY:

Foreign Trade Regulations of Norway, by Grant Olson, OBR 64-137, 8 pp., printed, Dec. 1964. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Norway's trade policy is aimed at expanding its foreign trade and shipping services. Exports of fresh and frozen fish are subject to the license control of the Fish Transport Division of the Ministry of Fisheries; canned fish come under the licensing control of the Fish

Canneries Export Committee. However, licenses for those products are issued automatically. In addition to trade policy, the report discusses Norway's import tariff system, sales and other internal taxes, shipping documents, and labeling and marking requirements. It also covers special customs provisions, nontariff import controls, Norway's export controls, United States foreign trade controls, and Government representation between that country and the United States.

"Lønnsomheten av fisket med motorbåter under 40 fot in 1962" (Profitability of fishing with motorboats under 40 feet in 1962), article, Fiskets Gang, vol. 50, no. 49, Dec. 3, 1964, pp. 717-732, illus., printed in Norwegian. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

NUTRITION:

"Studies with the use of fish oil fractions in human subjects," by Kunitaro Imaichi and others, article, American Journal of Clinical Nutrition, vol. 13, Sept. 1963, pp. 158-168, printed. American Journal of Clinical Nutrition, 49 W. 45th St., New York, N. Y. 10036.

OCEANOGRAPHY:

Data Report Equalant I, Volume I, 284 pp.; Volume II, Publication G-3, 790 pp., illus., printed, 1964, \$5.50 and \$5, respectively. National Oceanographic Data Center, Washington, D. C. 20390.

Data Report Equalant II, NODC Publication G-5, 754 pp., illus., printed, 1964, \$5. U. S. Naval Oceanographic Office, Washington, D. C. 20390.

"Djuphavsslätter och djuphavsgrovar" (Deep-sea plains and deep-sea trenches), by Auguste Piccard, article, Svenska Vastkustfiskaren, vol. 35, no. 1, Jan. 10, 1965, pp. 8-10, illus., printed in Swedish. Svenska Vastkustfiskarnas Centralforbund, Ekonomiutskottet Postbox 1014, Goteborg 4, Sweden.

Economic Benefits from Oceanographic Research (a Special Report of the Committee on Oceanography), Publication 1228, 56 pp., printed, 1964, \$2. Printing and Publishing Office, National Academy of Sciences/National Research Council, Washington, D. C. 20418. This report attempts to estimate some of the future economic benefits that could result from oceanographic research, and to compare them with the cost of doing the research. These benefits are of two kinds: annual savings in costs of goods and services, and increases in production. The report discusses anticipated benefits of oceanographic research in fisheries production, marine minerals, marine recreation, ocean shipping, long-range weather forecasting, sewage disposal, international cooperation, and national defense. Rational development of the United States domestic fisheries could result in doubling the production in 15 years, state the authors.

Geo Marine Technology, vol. 1, no. 2, Dec. 1964/Jan. 1965, 52 pp., illus., processed. INTEL, Inc., 739 National Press Bldg., Washington, D. C. 20005. Contains, among others, articles on: "Data processing at sea," by Robert M. O'Hagan; "U.S.C.G.--175-year history of working at sea," by E. John Long; "Mesoscaphe"; "Winch Buoys"; and "Russian Oceanography."

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

An International Directory of Oceanographers (Fourth Edition), compiled by Richard C. Vetter, 283 pp., processed, 1964. Printing and Publishing Office, National Academy of Sciences/National Research Council, 2101 Constitution Ave. NW., Washington, D. C. 20418. The publication of the fourth edition of the Directory four years after the previous edition (rather than the customary five) is evidence of accelerated world-wide oceanographic activities. The primary purpose of the Directory continues to be to assist oceanographers in corresponding with or visiting their colleagues in other countries. The lists are informal, unofficial, and do not constitute a complete directory of all who might be identified as oceanographers. The main criteria for inclusion are an individual's active participation in oceanographic programs and publication in scientific journals. Included are the names, addresses, and principal fields of 2,563 people in the biological, physical geological, chemical, engineering, and administration branches of oceanography, listed by country. A new feature is an appendix containing addresses of most of the large international organizations dealing with the marine sciences.

Life in the Sea, Photography: Lennart Nilsson, Text: Gösta Jägersten, 184 pp., illus., printed, 1964, \$10. Basic Books, 404 Park Ave. S., New York, N. Y. 10016. To many of us the sea has always been a mysterious universe seen mostly superficially or from afar. We know something of the large animals that inhabit the sea, but little or nothing of its smaller creatures. In this book the diverse and romantic small animals of the sea are explored by a photographer and a zoologist. The wedding of text and photographs gives a closeup of the smaller and less-known creatures to be found in the sea. The use of everyday language makes this book valuable as a general introduction to many of the unknown creatures of the sea, but its artistic presentation makes it an aesthetic addition to any library. A more intimate view of the sea is the general purpose of the book. The preface explains that its principal aim is to give the interested layman a picture of the rich "lower" world of "mainly smaller forms of marine life." Some of the creatures included in this book have never before been photographed and published either in popular or scientific publications, according to the author of the text. Also, all of the pictures are of living specimens. Described and illustrated with photographs (a few in color) are unicellular organisms; sponges; Cnidaria (hydrozoans, jellyfish, and coral); comb jellies or sea-gooseberries; flat worms and round worms; Myxozostomida (parasites living on spiny-skinned animals); bristle worms; Protodrilus (thread-like segmented worms) and wave-washed sand; crustaceans; sea spiders; molluscs; moss animals; spiny-skinned animals (such as starfish); invertebrate relatives of the vertebrates (such as sea squirts); and the pipefish and its habitat. Each chapter has a clear explanation and photographic illustrations. Included is a short discussion of the habitat in which they live. As an example of how a complex subject is presented in clear everyday language, this is how the discussion on sea-gooseberries or comb jellies begins: "If one studies the contents of a plankton net, one may find, in addition to great numbers of small organisms, many transparent lumps of jelly about the size and shape of a gooseberry. Transfer them carefully

to a jar of water and it will be seen that they are animals which, if uninjured and left in peace for a time, stretch out a pair of long, somewhat branched tentacles from two pockets situated on opposite sides of the body." Anyone interested in the sea should have a copy of this book.

--J. Pileggi

On the Limits of Accuracy in the Echo Soundings of Ocean Regions, by H. Gabler, Trans-107, 15 pp., printed. (Translated from the German, Deutsche Hydrographische Zeitschrift, vol. 12, no. 6, 1959, pp. 229-243.) Naval Oceanographic Office, Department of the Navy, Washington, D. C. 20240.

Most Efficient Use of Scientific and Information Materials in the Field of Oceanology, by V. A. Polushkin, JPRS 23281, 3 pp., processed. (Translated from the Russian, Okeanologiya, vol. 3, no. 3, 1963, pp. 537-539.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Oceanographic Computer Programs for the Programmed Data Processor-5, by Robert M. O'Hagan, Oceanographic (Unpublished) Manuscript, 44 pp., processed, Oct. 15, 1964, limited distribution. U. S. Coast Guard Oceanographic Unit, Washington, D. C. 20220.

Oceanographical Observations in the Indian Ocean in 1961, H.M.A.S. DIAMANTINA (Cruise Dm 3/61), Oceanographical Cruise Report No. 11, 218 pp., illus., processed, 1964. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

"Organic aggregates in seawater and the dynamics of their formation and utilization," by Gordon A. Riley, article, Limnology and Oceanography, vol. 8, no. 4, 1963, pp. 372-381, printed. Limnology and Oceanography, K. M. Rae, c/o George H. Lauss, University of Michigan, Ann Arbor, Mich.

"Who will own the ocean's wealth?" by William J. Cromie, article, United States Naval Institute Proceedings, vol. 91, no. 1, Jan. 1965, pp. 52-61, illus., printed, single copy 75 cents. United States Naval Institute, Annapolis, Md. As long as no one used the world ocean for anything but an inexpensive highway and a barrier against enemies, there was little interest in owning part of it. Freedom of the sea was an easy doctrine to preach and to maintain. But now that nations are convinced that the water world contains valuable resources, they are gradually encroaching upon this freedom. A struggle for ownership of the ocean is arising, and a new law of the sea is gradually taking form. This article documents the disputes among many nations for control of the sea's resources, both mineral and animal. The author suggests that a respected international agency would be a buffer against explosive national tempers and could attempt compromise solutions to such disputes. It could coordinate and sponsor research and development. The agency could also be given power to grant exploration and exploitation leases, and to control and monitor disposal of radioactive and other wastes.

The following reports of the U. S. Program in Biology, International Indian Ocean Expedition, are available from the Woods Hole Oceanographic Institution, Woods Hole, Mass.:

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Narrative Report: Anton Bruun Cruise 2, News Bulletin No. 3, 16 pp., illus., processed, Jan. 1964.

Narrative Report: Anton Bruun Cruise 3, News Bulletin No. 4, 11 pp., illus., processed, Feb. 1964.

Narrative Report: Anton Bruun Cruise 4-A, News Bulletin No. 5, 28 pp., illus., processed, March 1964.

Narrative Report: Anton Bruun Cruise 4-B, News Bulletin No. 6, 22 pp., illus., processed, April 1964.

Narrative Report: Anton Bruun Cruise 5, News Bulletin No. 7, 14 pp., illus., processed, Oct. 1964.

Narrative Report: Anton Bruun Cruise 6, News Bulletin No. 8, 8 pp., illus., processed, Dec. 1964.

Narrative Report: Anton Bruun Cruise 7, News Bulletin No. 9, 14 pp., illus., processed, Jan. 1965.

The following reprints are available from the Woods Hole Oceanographic Institution, Woods Hole, Mass. 02543,:

Adsorption of Phosphates onto Bubbles, by E. R. Baylor, W. H. Sutcliffe, and D. S. Hirschfeld, Contribution No. 1259, 5 pp., illus., printed. (Reprinted from Deep-Sea Research, vol. 9, no. 2, 1962, pp. 120-124.)

Dissolved Organic Matter in Seawater as a Source of Particulate Food, by E. R. Baylor and W. H. Sutcliffe, Jr., Contribution No. 1383, 3 pp., illus., printed. (Reprinted from Limnology and Oceanography, vol. 8, no. 4, Oct. 1963, pp. 369-371.)

Sea Surface Chemistry and Langmuir Circulation, by William H. Sutcliffe, Jr., Edward R. Baylor, and David W. Menzel, Contribution No. 1346, 11 pp., illus., printed. (Reprinted from Deep-Sea Research, vol. 10, 1963, pp. 233-243.)

The following articles are from Okeanologiya, vol. 3, 1963, Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.:

"Float for oceanographic research," by I. V. Faren-gol'ts, no. 4, p. 753.

"A flying oceanographic laboratory," by L. I. Itskevich, no. 5, p. 944.

"New bottom relief charts of the Pacific Ocean," by G. B. Udintsev, no. 1, pp. 169-175.

"Oceanographic vessels of the world," by L. I. Itskevich, no. 4, p. 758.

"Second Atlantic Expedition of the Academy of Sciences of the U.S.S.R. of the ships Sergei Vavilov and Petr Lebedev," by Yu. Yu. Zhitkovskii, no. 4, pp. 749-750.

ODOR ABATEMENT:

Is it Possible to Avoid the Smell from the Herring Meal Plants? by E. Gloppstad, G. Sand, and E. Arneson, Translation Series No. 161, printed. (Translated from the Norwegian, Medlinger fra Sildolje -og Sildemelindustrie Forskiings - Insti-

tutt, No. 4, 1953.) Technological Station, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

OYSTERS:

"Maintenance of oyster cells In Vitro," by Frank O. Perkins and R. Winston Menzel, article, Nature, vol. 204, no. 4963, Dec. 12, 1964, pp. 1106-1107, printed, single copy 6s. (about 85 U. S. cents). St. Martin's Press, Inc., 175 Fifth Ave., New York, N. Y. 10010.

Nucleotides of the Pacific Oyster CRASSOSTREA GIGAS (Thunberg), by V. Wylie and M. Smith, FRB Studies No. 880, 4 pp., illus., printed. (Reprinted from Canadian Journal of Biochemistry, vol. 42, 1964, pp. 1347-1351.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

Oysters and Oyster Culture in Norway, by Torbjorn Gaarder, and Paul Bjerkkan, Translation Series No. 217, 96 pp., printed. (Translated from the Norwegian, Jon Griegs Boktrykkeri, Bergen, Norway, 1934.) Atlantic Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B., Canada.

The following reprints from Proceedings of the National Shellfisheries Association, vol. 53, 1962, are available from the Virginia Institute of Marine Science, Gloucester Point, Va.

Oyster Mortality Studies in Virginia. IV--MSX in James River Public Seed Beds, by Jay D. Andrews, Contribution No. 155, pp. 65-84, illus., processed.

Studies on Oyster Scavengers and Their Relation to the Fungus DERMOCYSTIDIUM MARINUM, by Hinton Dickson Hoese, Contribution No. 162, pp. 161-174, illus., processed.

PANAMA:

"Potencialidad de la industria pesquera en Panamá" (Potential of the fishing industry in Panama), by Lenin Sucre Benjamin, article, Pesca y Marina, vol. 16, no. 6, Dec. 1964-Jan. 1965, pp. 14-15, printed in Spanish. Fernando Flores Limitada, 705 N. Windsor Blvd., Los Angeles 38, Calif.

PHYSIOLOGY:

"Critical contribution to the methods of evaluating the body-scale relation in studies of growth in fishes," by Milan Penaz, article, Zoologicki Listy, vol. 11, no. 1, 1962, pp. 77-80, printed in Czechoslovak, Českoslovensha Akademie, Ved Zoologicka, Komise, Nove Mestv, Vodickova 40, Prague 1, Czechoslovakia.

The Effect of Certain Physical Factors on the Sensitivity of Fish, L. J. Yu. A. Kholodov and K. B. Akhmedov, OTS 62-11771, 6 pp., processed. (Translated from the Russian, Biologiya Belogo Morya, vol. 1, 1962, pp. 256-261.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

PIRANHA:

Survival Potential of Piranhas in Florida, by Martin A. Moe, Jr., Contribution No. 79, 14 pp., illus., printed. (Reprinted from Quarterly Journal of the Florida Academy of Sciences, vol. 27, no. 3, Sept. 1964, pp. 197-210.) Marine Laboratory, Florida Board of Conservation, St. Petersburg, Fla.

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PLAICE:

"Variations in plaice fecundity in the Clyde area," by T. B. Bagenal, article, Journal of the Marine Biological Association of the United Kingdom, vol. 43, no. 2, 1963, pp. 391-399, printed, Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

PLANKTON:

The Open Sea: Its Natural History. Part I--The World of Plankton, by Alistair Hardy, 322 pp., illus., printed, 1965, \$12.50. Houghton Mifflin Co., 2 Park St., Boston 7, Mass.

Selected Articles on Plankton Studies, OTS 63-11106, 58 pp., illus., processed, 1964, 50 cents. (Translated from the Russian, Nauchnye Doklady Vysshei Shkoly, Biologicheskie Nauki, no. 1, 1961, pp. 11-12; Zoologicheskii Zhurnal, vol. 40, no. 1, 1961, pp. 122-128; Trudy Murmanskogo Morskogo Biologicheskogo Instituta, no. 2 (6), 1960, pp. 68-113.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Contains: "A modification of the Brodskii-Baskakov method for rapid plankton count" (Modifikatsiya metoda Brodskogo-Baskakova dlya bystrogo scheta planktona), by B. M. Mednikov; "High-speed plankton net" (Skorostnaya planktonicheskaya set'), by V. A. Yahsnov; and "Long-term dynamics of the plankton biomass in the southern Barents Sea and the factors determining it" (Mnogoletnyaya dinamika biomassy planktona yuzhnoi chasti Barentseva morya i faktory, ee opredelyayushchie), by E. A. Zelikman and M. M. Kamshilov.

POLAND:

"The Committee for Marine Research of the Polish Academy of Sciences," by M. Mysolvskii, article, Okeanologiya, vol. 3, no. 3, 1963, pp. 558-559, printed in Russian. Okeanologiya, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"Goals of the fishing industry," by Jerzy Grajter, article, Translations on East European Agriculture Forestry and Food Industries No. 136, JPRS 18367, pp. 86-91, processed, March 26, 1963, \$2.25. (Translated from the Polish, Tygodnik Morski, vol. 6, no. 5, 1963, pp. 1, 4.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

The following translations are for sale by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.:

Fish Industry in 1962, JPRS 19557, 8 pp., processed, June 4, 1963, \$2.25. (Translated from the Polish, Gospodarka Rybna, vol. 15, no. 3, 1963, pp. 21-23.)

Quota Fulfillment by Fish Industry, JPRS 17768, 5 pp., processed, Feb. 21, 1963, \$2.75. (Translated from the Polish, Gospodarka Rybna, vol. 14, no. 9, Dec. 1962, pp. 27-28.)

POLLOCK:

"Parasitic infestation of the Alaskan pollack in relation to its utilization as a food fish," by A. V. Gusev, E. V. Zhukov, and Yu. A. Strelkov, article, Translation of Doklady Biological Sciences Sections, vol. 125, nos. 1-6, pp. 344-346, printed. (Translated from the Russian, Doklady Akademii Nauk SSSR,

vol. 125, no. 5, 1959, pp. 1174-1176.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

POND FISHERIES:

Fish Dealers, compiled by Al Lopinot, Fish Mgt. Mimeo No. 16, 4 pp., processed, April 1964. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706. Lists names and addresses of dealers throughout the United States who raise and supply fish for pond and lake stocking purposes, and species and sizes handled by each dealer.

"Increasing the fish productivity of rearing ponds by the use of fertilizers," by L. I. Mamontova, article, Doklady Moskov. Sel'skokhoz. Akad. Im. K. A. Timiryazeva, vol. 69, 1961, pp. 171-174, printed in Russian. Doklady Moskov. Sel'skokhoz. Akad. Im. K. A. Timiryazeva, Moscow, U.S.S.R.

PORTUGAL:

"Nuevas perspectivas en el sistema Portugues de comercializacion de las conservas de pescado" (New outlook in the Portuguese system of marketing canned fish), article, Industria Conservera, vol. 30, no. 302, Aug. 1964, pp. 213-214, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

PROCESSING:

"Mechanization of the preliminary processing of salted herring (at the Kaliningrad fish collective)," by M. M. Piletskii, article, Raboty Rybokhozyaistvennoi Laboratorii Voronezhskogo Universiteta, vol. 2, 1962, pp. 62-71, printed in Russian. Raboty Rybokhozyaistvennoi Laboratorii Voronezhskogo Universiteta, Voronezh, U.S.S.R.

Regulations on Certain Sea Food Processing Industries in Mediterranean Countries, by D. Remy, GFCM Studies and Reviews No. 24, 32 pp., processed in English (French version also available), Sept. 1964. General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Sections on semipreserves, salting, smoke curing, and dry curing each discuss definitions, species used, processing standards, and packaging. Countries concerned are France, Greece, Morocco, Spain, Tunisia, Turkey, and Yugoslavia.

QUALITY:

Elintarvikkeiden Aistinarvostelumenetelmista (On sensory testing methods), by Alpo Siirila and Olavi E. Nikkila, Tiedotus, Sarja IV, Kemia 62, 40 pp., illus., processed in Finnish with English summary, 1964. Valtion Teknillinen Tutkimuslaitos, Lonnrotinkatu 37, Helsinki, Finland. Discusses sensory testing methods in the production, development, and research work of foodstuffs. In a short survey of the senses and their activity, the possibilities and limits of subjective evaluation are described.

RADIOACTIVE WASTES:

Radioactive Contamination of the Seas and Oceans, USSR, by K. N. Fedorov and others, JPRS 26, 002, 109 pp., processed, Aug. 20, 1964, \$4. (Translated from the Russian, Radioaktivnaya Zagryaznennost'

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

More i Okeanov, Moscow, U.S.S.R., 1964.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

RESEARCH VESSEL:

Articles from *Okeanologiya*, printed in Russian; *Okeanologiya*, Akademiia Nauk SSSR, Moscow, U.S.S.R.:

"A new oceanographic research vessel, *Jalanidhi*, of Indonesia," by N. A. Skryagin, vol. 4, no. 1, 1964, pp. 186-188.

"A new U. S. Navy research vessel, *James M. Gillis*, for oceanographic work," by V. G. Samarin, vol. 3, no. 6, 1963, pp. 1123-1125.

Selection of Type of an Oceanographic Research Vessel, by I. A. Stoyanov, JPRS 25068, 8 pp., processed, (Translated from the Russian, *Okeanologiya*, vol. 4, no. 2, 1964, pp. 342-349.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

RESOURCES:

Possibility of Exploiting the Fishery Resources of the World Ocean, by T. S. Rass, OTS 64-21588, 5 pp., processed, 1964. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 3, 1963, pp. 495-499.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

ROUGHFISH:

Rotenone for Eradication of Undesirable Fish in Management of Lakes and Ponds, Fisheries Leaflet No. 5, 3 pp., printed, 1960. Division of Fisheries, Illinois Department of Conservation, Rm. 102, State Office Bldg., Springfield, Ill. 62706.

SALMON:

"Approach from population dynamics to ratio of salmon falling off gill nets," by Takayuki Doi, article, *Bulletin of the Tokai Regional Fisheries Research Laboratory*, vol. 34, 1962, pp. 13-18, printed in Japanese. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

"Biology of the pink salmon of the White Sea," by F. B. Mukhomedyarov, article, *Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii*, vol. 1, 1963, pp. 49-52, printed in Russian. *Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii*, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"A few notes of migration groups by analysis of scale patterns on the pink salmon, *Oncorhynchus gorbuscha*," by Tetsuo Ogata, article, *Bulletin of the Japan Sea Regional Fisheries Research Laboratory*, no. 13, 1964, pp. 15-24, printed. Japan Sea Regional Fisheries Research Laboratory, Miigata, Northwest Honshu, Japan.

"An investigation of louvers as a method of guiding juvenile Pacific salmon," by C. P. Ruggles and P. Ryan, article, *The Canadian Fish Culturist*, issue 33, Nov. 1964, 68 pp., illus., printed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

"Materialy o rechnom periode zhizni simy" (Data on the river stage of the salmon *Oncorhynchus masu*), by M. L. Krykhtin, article, *Izvestia Tikhookeanskogo Nauchno-Issledovatel'skogo Instituta Rybnogo Khoziaistva i Okeanografii*, vol. 48, 1962, pp. 84-132, printed in Russian. Four Continent Book Corp., 156 Fifth Ave., New York, N. Y. 10010.

"Method of breeding young salmon in Northern Caucasus," by A. E. Tamarin, article, *Raboty Rybokhozyaystvennoi Laboratorii Voronezhskogo Universiteta*, vol. 2, 1962, pp. 3-10, printed in Russian. *Raboty Rybokhozyaystvennoi Laboratorii Voronezhskogo Universiteta*, Voronezh, U.S.S.R.

Symposium on Pink Salmon, edited by N. J. Wilimovsky, H. R. MacMillan Lectures in Fisheries, 226 pp., illus., printed, 1962. Institute of Fisheries, University of British Columbia, Vancouver 8, B. C., Canada. Contains the text of papers presented and pertinent discussions at a symposium held at the University of British Columbia, Oct. 13-15, 1960. Included are: "The observed fluctuations of pink salmon in British Columbia," by Ferris Neave; "Pink salmon fluctuations in Alaska," by William F. Royce; "Some problems of the pink salmon fisheries in Asian waters," by Kisaburo Taguchi; "Pink salmon populations of the Fraser River System," by E. H. Vernon; "Freshwater survival of pink salmon at Sashin Creek, Alaska," by Theodore R. Merrell, Jr.; "Environmental variability and reproduction potentials of pink salmon in British Columbia," by W. P. Wickett; "Relation of stream temperatures to timing of pink salmon escapements in Southeast Alaska," by William L. Sheridan; "Marine factors affecting the survival of Fraser River pink salmon," by Philip Gilhousen; "Marine survival, distribution and migration of pink salmon (*Oncorhynchus gorbuscha*) off the British Columbia Coast," by J. I. Manzer and M. P. Shepard; and "Observations on pink salmon in the Aleutian Island Area 1956-1960," by Allan C. Hartt. Also included are: "Aspects of the marine biology of Asiatic pink salmon," by Teruo Ishida; "Differentiation of stocks," by Donald D. Worlund and Reynold A. Fredin; "Regulation of the abundance of pink salmon populations," by W. E. Ricker; "A concept of the dynamics of pink salmon populations," by Robert R. Parker; and "The relationship between numbers spawning and numbers returning in Pacific salmon," by W. F. Thompson.

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"Statistical methods for estimating California salmon landings," by Norman J. Abramson, pp. 6-12.

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Changes in the Multiple Hemoglobin Patterns of some Pacific Salmon, Genus ONCORHYNCHUS, during the Parr-Smolt Transformation, by W. E. Vanstone, Eve Roberts, and H. Tsuyuki, FRB Studies No. 884, 7 pp., illus., printed. (Reprinted from Canadian Journal of Physiology and Pharmacology, vol. 42, 1964, pp. 697-703.)

Formation of Purine and Pyrimidine Nucleosides, Deoxynucleosides, and the Corresponding Mononucleotides by Salmon Milt Extract Nucleoside Phosphorylase and Nucleoside Kinase Enzymes, by H. L. A. Tarr, FRB Studies No. 897, 11 pp., printed. (Reprinted from Canadian Journal of Biochemistry, vol. 42, 1964, pp. 1535-1545.)

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"L'assorbimento del sale e la sua diffusione nelle conserve di sardine all'olio" (The absorption of salt and its diffusion in canned sardines in oil), by R. Meesemaeker and Y. Sohler, article, Industria Conserve, vol. 39, no. 4, Oct.-Dec. 1964, pp. 301-306, illus., printed in Italian. Industria Conserve, Viale Tanara 33, Parma, Italy.

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"Isolation of 22-Dehydrocholesterol from scallop," by T. Tamura and others, article, Canadian Journal of Biochemistry, vol. 42, Sept. 1964, pp. 1331-1337, printed. Canadian Journal of Biochemistry, The National Research Council, Sussex St., Ottawa 2, Canada.

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"Sel på Norskekysten fra Finnmark til Møre" (Seals on the Norwegian Coast from Finnmark to Møre), by Per Øynes, article, Fiskets Gang, vol. 50, no. 48, Nov. 26, 1964, pp. 694-707, illus., printed in Norwegian with English summary. Fiskets Gang, Fiskeridirektoratet, Radstuplass 10, Bergen, Norway.

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"Grey seals choose to be overcrowded," no. 416, Nov. 5, 1964, p. 342.

"Why the grey seal matters," by John Hillaby, no. 418, Nov. 19, 1964, pp. 502-503, illus.

SEAWEED:

"Seaweed: the facts and the fiction," by N. W. Pirie, article, New Scientist, vol. 23, July 23, 1964, p. 236, printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

"Seaweeds--their uses as food and in industry," by J. Moore, article, Commercial Fishing, vol. 3, no. 4, Dec. 1964, pp. 26, 29-30, illus., printed. Trade Publications, Ltd., 47 Lewis Eady Bldg., Queen St., Auckland, New Zealand.

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"Khishchniki morei i ikh promysel" (Predators of the seas and their economic importance), by N. V. Parin, Priroda, vol. 52, no. 12, 1963, pp. 62-68, illus., printed in Russian. Akademiia Nauk SSSR, M. Khariton'yevski per. 4, Moscow, U.S.S.R. Discusses the predatory habits of sharks. The utilization of shark meat, liver oil, fins, and skin is considered. The effects of sharks on the tuna industry are described together with methods for foiling their attacks. Man-eating sharks and factors affecting their attacks are discussed, and chemical repellents and biological and mechanical protective measures are considered. The author believes that none of the methods currently used is completely effective.

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"Studies on the physiology of a shrimp, Metapenaeus mastersii (Haswell) (Crustacea: Decapoda: Penaeidae), I--Blood constituents," by W. Dall, article, Australian Journal of Marine and Freshwater Research, vol. 15, no. 2, Nov. 1964, pp. 145-161, illus., printed, single copy 10/- (about US\$1.10). Editorial and Publications Section, Commonwealth Scientific and In-

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dustrial Research Organization, 372 Albert St., East Melbourne C2, Victoria, Australia.

SMALL BUSINESS MANAGEMENT:

Legal Aspects of Small Business Use of Cooperative Arrangements, by Stanley F. Hack, Management Research Summary, 2 pp., processed, 1964. Small Business Administration, Washington, D. C. 20416. Many small businesses have been able to lower costs and strengthen their marketing positions by entering into various cooperative arrangements. This report examines statutes and judicial decisions that have established guidelines for the opportunities in and restrictions on such agreements. The Capper-Volstead Act authorizes agricultural producers to form cooperatives for processing, preparing for market, handling, and marketing their products. The Fisheries Act grants similar privileges to fishermen. Activities most frequently challenged under both laws include conspiracies with non-cooperatives, boycotts, attempts to monopolize trade, and mergers.

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"Age, growth, maturity, and sex composition of the American smelt, *Osmerus mordax* (Mitchill), of western Lake Superior," by Merryll M. Bailey, article, Transactions of the American Fisheries Society, vol. 93, no. 4, 1964, pp. 382-395, printed. American Fisheries Society, 1404 New York Ave. NW., Washington, D. C. 20005.

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"Smoking of fish in a high-tension current," by N. Shishkalova and V. Goncharov, article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, p. 17, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

SOLE:

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"Movements of petrale sole, *Eopsetta jordani* (Lockington), tagged off California," by Edgar Allan Best, pp. 23-28, illus.

"Results from tagging a spawning stock of Dover sole, *Microstomus pacificus*," by Sigurd J. Westheim and Alfred R. Morgan, pp. 14-21, illus.

SOUTH CAROLINA:

Annual Report, 1963-1964, Contributions from Bears Bluff Laboratories No. 41, 10 pp., illus., printed, Jan. 1965. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1963-June 30, 1964.) Bears Bluff Laboratories, Wadmalaw Island, S. C. Discusses the accomplishments during the year ended June 30, 1964; the study of oysters, plankton, shrimp, finfish, fish kills, and pond cultivation. Also discusses operation of a new fishery research vessel.

SPAIN:

"Conclusiones generales de la Comision III--Ordenación y expansión de la pesca e industrias derivadas" (General conclusions of Commission III--Or-

ganization and expansion of the fishery and byproducts industries), article, Boletín de Información, no. 72, September 1964, pp. 5-12, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6ª Planta, Madrid, Spain.

The following articles are from Industria Conservera, vol. 30, printed in Spanish. Unión de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain:

"La industria conservera y la exportación" (The canning industry and the export market), by Alevin, no. 302, Aug. 1964, p. 207, illus.

"Operaciones conserveras: las de la sardina y especies afines al arenque" (Canning operations: those of the sardine and species related to herring), no. 304, Oct. 1964, pp. 265-266.

"Ordenación y expansión de la industria conservera Gallega" (Organization and expansion of the Galician canning industry), by Alevin, no. 305, Nov. 1964, pp. 291-294.

SPINY LOBSTER:

The following are from Commonwealth Scientific and Industrial Research Organization, 314 Albert St., East Melbourne C2, Victoria, Australia:

The Southern Crayfish (JASUS LALANDII), by P. Grua, Translation No. 5380, 26 pp., printed. (Translated from the French, Australes et Antarctiques Françaises, no. 10, 1960, pp. 15-40.)

"The spiny lobster, *Jasus lalandei* (H. Milne-Edwards), in South Australia. II--Reproduction," by D. R. Fielder, article, Australian Journal of Marine and Freshwater Research, vol. 15, no. 2, Nov. 1964, pp. 133-144, illus., printed, single copy 10/- (about US\$1.10).

SPOILAGE:

Control of Bacterial Spoilage of Fish, by H. L. A. Tarr, 5 pp., printed. (Reprinted from Developments in Industrial Microbiology, vol. 5, 1964, pp. 135-139.) Technological Research Laboratory, Fisheries Research Board of Canada, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

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"Mechanized squid jigger," by J. J. Quigley, article, Trade News, vol. 17, no. 5, Nov. 1964, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. The hand-line jigger used on Newfoundland's bait squid jigging grounds for centuries may soon be replaced by a new Japanese device. The mechanism consists of drum haulers mounted on the vessel railing, special lure hooks, and a light attraction system. Besides being more productive, the hauler eliminates the back-breaking work involved in the traditional jigging operation. With a machine for turning the drum, it should be possible for one man to operate as many as 10 lines of jiggers.

STERN TRAWLERS:

The following articles are from Construction and Running of Stern-Trawlers, Translation No. 813, printed. (Translated from the German, Hansa-Schiffahrt-

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Schiffbau-Hafen, vol. 98, no. 23, 1961); Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.:

"Operational experiences with stern trawlers," by J. Greiss.

"Stern trawlers and their fishing gear," by H. Heinsohn.

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"L'avenir de la pêche aux Îles Saint-Pierre-et-Miquelon" (The future of the St. Pierre and Miquelon Islands' fishery), by P. Schmitz, article, La Pêche Maritime, vol. 44, no. 1042, Jan. 1965, pp. 3-5, 6, printed in French, single copy 14 F (about US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris 8^e, France.

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Operation of the Trade Agreements Program, 15th Report, July 1962-June 1963, TC Publication 147, 152 pp., processed, 1964. United States Tariff Commission, Washington, D. C. 20436. During the period covered by the 15th report, the Trade Expansion Act of 1962 became law; the Congress thereby delegated to the President new authority to enter into trade agreements and to modify U. S. rates of duty to carry out such agreements. The members of the General Agreement on Tariffs and Trade (GATT) began preparing for the sixth round of multilateral trade-agreement negotiations--widely known as "the Kennedy round." The 20th Session of the Contracting Parties to the GATT was held in the fall of 1962. This report discusses in detail the Trade Expansion Act, developments relating to the General Agreement on Tariffs and Trade, actions of the United States relating to its Trade Agreements Program, and major commercial policy developments in countries with which the United States has trade agreements.

TERRITORIAL WATERS:

"O carácter duma disposição especial que permita alargar o limite do domínio público marítimo com vista aos interesses da pesca" (The character of the special situation which permits increasing the limit of the marine public domain with a view to the interests of the fishery), by Victor Augusto Pereira Nunes, article, Boletim da Pesca, vol. 16, no. 84, Sept. 1964, pp. 11-26, printed in Portuguese. Ga-

binete de Estudos das Pescas, R. S. Bento, 644, 4^o Esq., Lisbon, Portugal.

TILAPIA:

"Contribution a l'etude de l'adaptation des Tilapia (Pisces, Cichlidae) a la vie en milieu mal oxygene" (A contribution to the study of the adaptation of the Tilapia--Pisces, Cichlidae--to life in a poorly oxygenated environment), by J. Dusart, article, Hydrobiologia, vol. 21, nos. 3/4, 1963, pp. 328-341, printed in French. Hydrobiologia, Uitgeverij Dr. W. Junk, The Hague, Netherlands.

"Tilapia in the South Pacific," by L. C. Devambez, article, South Pacific Bulletin, vol. 14, no. 4, Oct. 1964, pp. 27-28, 52, illus., printed, single copy 30 cents. South Pacific Commission Publications Bureau, G. P. O. Box 5254, Sydney, Australia. Since 1954, various Tilapia species have been introduced into most of the South Pacific islands with notable success. This small fresh-water fish is unusually hardy, adaptable to widely different environments, a most prolific breeder, and valuable in mosquito control. The Tilapia is well suited to the role it plays in the South Pacific--to populate those waters which previously were very often empty and sometimes rather poorly equipped to support aquatic life--and to do this in the absence both of specialized staff and fish-culture establishments, according to the author.

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"The building of large fish trawlers," by E. M. Gorbenko, article, LLU Translation Bulletin, vol. 2, no. 1, Jan. 1960, pp. 25-41, printed. (Translated from the Russian, Sudostroenie, no. 5, 1959, pp. 33-37.) National Lending Library for Science and Technology, Boston Spa, Yorkshire, England.

"News of the trawler Rubtsovsk. Interview with the captain of the SRT Rubtsovsk," by V. A. Voronkov, article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, pp. 12-13, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

TRAWLING:

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"Hematomas in trout," article, Nutrition Review, vol. 22, July 1964, pp. 208-210, printed. The Nutrition Foundation Inc., 99 Park Ave., New York, N. Y. 10016.

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Bigeye Studies. II--A Consideration of the Size Composition of Bigeye Taken on Pole and Line, by Mitsuo Honma and Tadao Kamimura, 7 pp., printed. (Translated from the Japanese, Bulletin of the Japanese Society of Scientific Fisheries, vol. 20, no. 10, 1955, pp. 863-869.) Available on loan from Fisheries-Oceanography Library, University of Washington, Seattle, Wash. 98105.

The Biology of the Yellowfin Tuna, THUNNUS ALBACARES (Bonnaterre), in the Gulf of Guinea, by Gilbert W. Bane, Jr., Order No. 64-3702, 444 pp., 1963, microfilm \$5.65; Xerography \$20.05. University Microfilms, Inc., University of Michigan, 313 N. 1st St., Ann Arbor, Mich.

"Chile impulsa su industria atunera" (Chile develops its tuna industry), article, Mundo Pesquero, vol. 2, no. 15, Nov. 1964, p. 20, illus., printed in Spanish, single copy \$/. 6.00 (about 25 U. S. cents). Mundo Pesquero, Av. Oscar R. Benavides 1207 (Colonial), Lima, Peru.

Prospección y pesca de atunes en las costas de Provenza, Córcega y golfo de Génova (Exploration and fishery for tuna along the coasts of Provence and Corsica and in the Gulf of Genoa), by Pierre Gougelet, article, Puntal, vol. 11, no. 127, Oct. 1964, pp. 14-17, illus., printed in Spanish, single copy 12 ptas. (about 20 U. S. cents). Puntal, Apartado de Correos 316, Alicante, Spain.

Ships for Tuna Fishing (Statki do Polowow Tunczyka), by Jacek Forembiski and Bohdan Pradzynski, OTS 63-11394, 11 pp., illus., processed, 1964. (Translated from the Polish, Budownictwo Okretowe, no. 3, 1961, pp. 90-92.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

TURKEY:

Balik ve Balıkcılık (Fish and Fishery), vol. 12, no. 12, Dec. 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balık Kurumu G. M., Balıkcılık Mudurlugu, Besiktas, Istanbul, Turkey. Contains, among others, articles on: "Production of black caviar in Turkey and its problem (Part I)," by Cevdet Aygun; "Technological developments in the field of fish flour (Part I)," by Hikmet Akgunes; and "Synthetic fibres in the fishing industry (Part I)," by Necla Gurturk.

TURTLES:

"La protección de las tortugas marinas" (The protection of marine turtles), by Alberto Alvarez-Pinzon, article, Iberica, vol. 42, no. 28, Oct. 1964, pp. 376-378, illus., printed in Spanish, single copy 18 ptas. (about 30 U. S. cents). Iberica, Palau, 3. Apartado 759, Barcelona-2, Spain.

UNITED KINGDOM:

Directory and Equipment Guide, 1965, by Arthur J. Heighway and E. Melville Dougall, 184 pp., illus.,

printed, £1 12s. (about US\$4.50). Fishing News, 110 Fleet St., London EC4, England. This is a most comprehensive directory of the British fishery and allied industries of interest to all those concerned with the United Kingdom's fisheries and industry. It contains lists of fishing vessels, owners and managers, individual fleets, fishing craft in all United Kingdom ports, and builders of fishing vessels; propulsion, transmission, and steering equipment suppliers and manufacturers; electronics and radio equipment suppliers and manufacturers; chandlery and lifesaving equipment suppliers and manufacturers; catching and hauling equipment suppliers and manufacturers; and marketing and processing equipment manufacturers. It also includes lists of fishery officials, government organizations, and trade associations; and an alphabetical index of all suppliers and manufacturers. A complete change in format is evident in this fifth edition. Each section has an introductory article with information on the latest trends in that segment of the fishing industry. Included are full details of vital parts of important vessels launched or completed during the past 12 months; and a list of the abbreviations used for official fishery agencies.

U.S.S.R.:

"Fishing industry of the national reservoirs in the Voronezh region in 1958-60," by A. V. Fedorov and E. V. Afonyushkina, article, Raboty Rybnokhozyaistvennoi Laboratorii Voronezhskogo Universiteta, vol. 2, 1962, pp. 20-41, printed in Russian. Raboty Rybnokhozyaistvennoi Laboratorii Voronezhskogo Universiteta, Voronezh, U.S.S.R.

"La industria de la pesca en Rusia" (The fishing industry in Russia), article, Informacion Conservera, vol. 12, no. 129, Sept. 1964, pp. 363-364, printed in Spanish, single copy 30 ptas. (about 50 U. S. cents). Informacion Conservera, Colon, 62, Valencia, Spain.

"Progress of science in the fishing industry," by N. Novikov, article, Rybnaya Promyshlennost Dal'nego Vostoka, no. 1, 1963, pp. 7-10, printed in Russian. Rybnaya Promyshlennost Dal'nego Vostoka, Vladivostok, U.S.S.R.

"Red flag over the seven seas," by Hanson W. Baldwin, article, The Atlantic Monthly, vol. 214, no. 3, Sept. 1964, pp. 37-43, printed, single copy 75 cents. The Atlantic Monthly, 8 Arlington St., Boston, Mass. 02116. Contains a section on the Soviet fishing fleets.

The following are available from Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.:

General Studies on Fishing Industry, USSR, TT64-31853, 71 pp., illus., processed, July 24, 1964, \$3. (Translated from the Russian, Rybnoe Khoziaistvo, no. 4, 1964.)

"A possible method of controlling the food supply of fish in Taganrog Gulf in the Sea of Azov," by A. F. Gun'ko, article, Translation of Doklady Biological Sciences Sections, vol. 127, nos. 1-6, pp. 664-666, printed. (Translated from the Russian, Doklady Akademii Nauk SSSR, vol. 127, no. 4, 1959, pp. 900-902.)

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VENEZUELA:

Establishing a Business in Venezuela, by William Fröhlich, OBR 64-141, 20 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Rich economic resources, rapid economic and population growth, economic stability, strong currency, freedom to remit capital and profits abroad, and proximity to world markets are among the factors tending to attract investors to Venezuela. The report contains information on Venezuela's investment climate; legislation governing investment; organization of business; and patent, trademark, and copyright protection. Also discusses the employment situation, income and other taxes, availability of capital, basic economic facilities, and investment information services.

VESSELS:

Mechanization of Small Fishing Craft, edited by John Burgess, 112 pp., illus., printed. Arthur J. Heighway Publications Ltd., 110 Fleet St., London EC4, England. Much of the information in this book is based upon papers presented at a symposium on the mechanization of fishing craft held in Seoul, Korea, in 1962, and organized by the Food and Agriculture Organization of the United Nations and its Indo-Pacific Fisheries Council. Section 1, Installation and operation of outboard motors, with a foreword by D. B. Finn, includes articles on: "The impact of outboard mechanization of developing fisheries," by Jan-Olof Traung; "Development of mechanized fleets in Indo-Pacific fisheries," by K. Chidambaram; "Outboards in tropical fisheries," by John Burgess; and "Overcoming problems on boat design, servicing and fuel costs," by Jan-Olof Traung. Section 2, Inboard engines in open craft, presents articles on: "Phases in the transition to mechanized vessels," by P. Gurtner; "Design considerations. I; II"; "Open fishing craft with inboard engines," by Jan-Olof Traung; "Selection of marine engines under 50 h.p.," by E. Kvaran; and "Engine beds for small fishing boats," by Erik Estlander. Section 3, Inboard engines in decked craft, includes these articles: "Problems with small decked fishing craft," by Jan-Olof Traung; "Development in Hong Kong," by W. D. Orchard; "Transition in Japan and Korea," by S. Takayama and Z. G. Kim; and "Efficient propeller selection," by Jan-Olof Traung. Section 4, Problems of engine service and maintenance, contains these articles: "Seven conditions to ensure smooth running," by E. Kvaran; "Fuels and lubricants for small engines," by John Burgess; "Problems of servicing in less developed countries," by L. Stenstrom; and "Some parameters for plotting fishing craft power," by Jan-Olof Traung.

VIET-NAM:

"How to increase the catch of salt-water fish," by Hoang Xuan Hai, article, Selected Articles from Fishing Industry in North Viet Nam, JPRS 655-D, pp. 1-4, printed. (Translated from the Vietnamese, Nong Lam (North Viet Nam), no. 1, Jan. 1959, pp. 28-29.) Photoduplication Service, Library of Congress, Washington, D. C. 20540.

VITAMINS:

A Chemical Method for the Estimation of Vitamin D in Fish Oils, by I. N. Garkin and V. N. Bukin, 60-13713, 10 pp., processed, microfilm \$2.40, photostat \$3.30. (Translated from the Russian, *Biokhimiya*, vol. 16, no. 2, 1951, pp. 176-185.) Photoduplication Service, Library of Congress, Washington, D. C. 20540.

The following abstracts are from Chemical Abstracts; American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.:

"The molecular distillation of Vitamin A from the fats of marine animals," by S. I. Maksimov, vol. 59, Nov. 25, 1963, Abstract No. 13110c.

"Preparation of 'Ketone 250' from the Vitamin D of tunny fish liver," by Y. Raoul and N. Le Boulch, vol. 58, May 27, 1963, Abstract No. 11612f.

"Utilization of oils and fats from viscera of aquatic animals. V--Industrial adaptability of the esterification methods for concentrating Vitamin A," by Hiroshi Sone, vol. 60, April 27, 1964, Abstract No. 10479c.

WHALE MEAT:

"Preservation of whale meat for feeding purposes," by L. Sheml'kova and V. Kulyasova, article, *Rybnaya Promyshlennost Dal'nego Vostoka*, no. 1, 1963, p. 16, printed in Russian. *Rybnaya Promyshlennost Dal'nego Vostoka*, Vladivostok, U.S.S.R.

WHALES:

"Progress report on sperm whale research in the southeast Pacific Ocean," by Robert Clarke, Anelio Aguayo L., and Obla Paliza G., article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 53, no. 11, Nov. 1964, pp. 297-302, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

The following reports, reprinted from *Tuatara*, vol. 12, no. 2, July 1964, are available from the Fisheries Laboratory, Marine Department, Wellington, New Zealand:

Recent Observations in New Zealand Waters on Some Aspects of Behaviour of the Sperm Whale (PHYSETER MACROCEPHALUS), by D. E. Gaskin, No. 66, pp. 106-114, illus., printed.

Return of the Southern Right Whale (EUBALEANA AUSTRALIS Desm.) to New Zealand Waters, 1963, by D. E. Gaskin, No. 67, pp. 115-118, illus., printed.

WHALING:

Australian Whaling, 1963, Catch Results and Research, by J. L. Bannister, Report 38, 34 pp., illus., processed, 1964. Marine Laboratory, Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Cronulla, Sydney, Australia. At Albany, Australia, the sperm whale catch per unit of effort during 1963 was less than in either of the two previous years. An analysis of results from the first 13 months of an aerial survey off the Western Australian coast shows that sperm whales are found farther offshore on the west coast while being concentrated near the continental shelf on the southwest coast. Provisional estimates of the density of sightings show a peak of abundance in November.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ber. Catch and effort data for the small number of humpback whales caught during 1963 show that this species continued to decline. The catchable stock is estimated at 568 humpbacks, of which not more than 261 could be adult. No further catches of humpbacks are expected for some years because of the recent international agreement prohibiting their capture in the southern hemisphere. This report includes a number of statistical tables showing catch and effort, and lengths of sperm and humpback whales landed by Australian vessels, 1963.

WHALING:

"Effects of various catch quotas," article, Norsk Hvalfangst-Tidende, vol. 53, no. 12, Dec. 1964, pp. 321-323, printed. Hvalfangerforeningen, Sandefjord, Norway.

WHITEFISH:

"Acclimatization of the whitefish (Coregonus peled) in small Karelian lakes," by Z. A. Gorbunova, article, Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, vol. 1, 1963, pp. 181-186, printed in Russian. Problemy Ispol'zovaniya Promyslovnykh Resursov Belogo Morya i Vnutrennykh Vodoemov Karelii, Akademiia Nauk SSSR, Moscow, U.S.S.R.

"Promyshlennoe vyrashchivanie molodi sigovykh ryb v Belorussii" (Commercial raising of young whitefish in Belorussia), by A. L. Shteinfel'd, article, Referativnii Zhurnal-Biologiya, 1963, Abstract No. 17159, printed in Russian. Akademiia Nauk SSSR, Institut Nauchnoi-Informatsii, Moscow, U.S.S.R.



CORRECTION

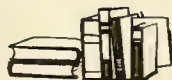
The December 1964 issue, page 157, showed that the report, Postwar Expansion of Russia's Fishing Industry, was available from the U. S. Government Printing Office. We now find that the report may be obtained only from the Committee on Commerce, United States Senate, Washington, D. C., and distribution is limited.



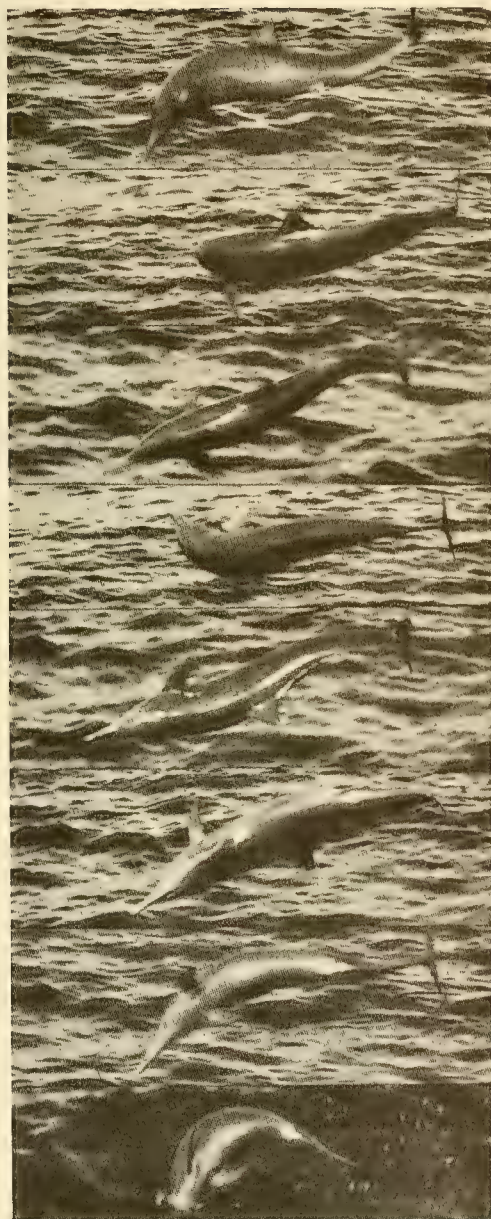
SUBJECT INDEXES FOR COMMERCIAL FISHERIES REVIEW

The subject index for Vol. 23 (1961) of Commercial Fisheries Review was issued and mailed to those on the mailing list for the Review. The index for Vol. 25 (1963) is in press.

Subject indexes for Vol. 19 (1957), Vol. 20 (1958), Vol. 21 (1959), Vol. 22 (1960), Vol. 24 (1962), and Vol. 26 (1964) have not been issued yet. We hope to issue indexes for those volumes in the near future.



GYRATIONS OF SPINNER PORPOISE FILMED AS AID TO MARINE-ANIMAL BEHAVIOR STUDIES



Film sequences showing spinning behavior of the porpoise.

Scientists of the U. S. Bureau of Commercial Fisheries' eastern Pacific tuna behavior program at La Jolla, Calif., have chalked up an interesting "first" in the field of marine-animal behavior--a documentary motion picture film of the spinning behavior of the spinner porpoise (*Stenella microps* Gray). This porpoise, or as some authorities prefer to call it, dolphin, was originally represented in the world's collections by a single skull from the Islas Tres Marias near the mouth of the Gulf of California, and was thought to be a rare species until Bureau scientists sent several specimens to the U. S. National Museum for identification. A description of the spinning jumps made by the porpoise was received with skepticism by several cetacean experts (although known to area fishermen), who were unaware of such behavior and thought it might be an optical illusion caused by a rotary motion of the tail.

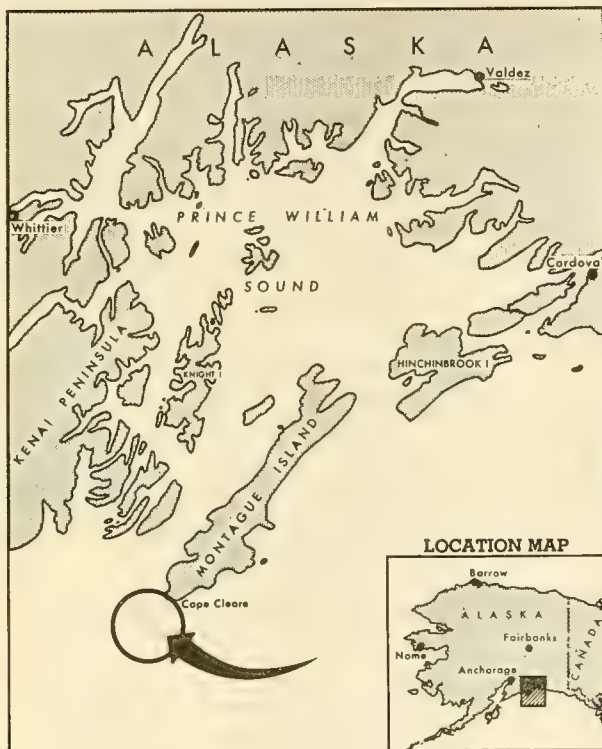
The film was taken to substantiate observations made by the Bureau biologists. It was shown at the First International Symposium on Cetaceans held in Washington, D. C., in August 1963. As a result of that showing, requests for copies of the film have been received from several foreign scientists including a Dutch scientist in the Netherlands who is an international authority on cetaceans and author of the book Whales.

Two types of behavior are demonstrated in the film. The first is a combination of forward and upward motions necessary to bring the porpoise's blow-hole clear of the water. As swimming speed increases, the amount of body exposed increases until, at moderate speeds, the entire animal is out of the water. The second type of jumping behavior differs from the first in that the angle at which the porpoise leaves the water is usually much greater, the duration of the jump is increased many times, and the animal rotates its body rapidly before it re-enters the water, head first. Often the animal does not clear the water completely and the spinning occurs with the tail submerged. This porpoise also may make several spinning jumps in succession, rotating in a clockwise or counterclockwise direction. The cause of that behavior is not known. Remoras or shark suckers frequently are seen attached to swimming porpoises and at first it was thought the spinning was an attempt to dislodge them; however, remoras are not attached to all spinning porpoises. Courtship display has been rejected as a possible cause since spinning has been observed in immature animals.

The spinner porpoise is often associated with schools of yellowfin tuna in the eastern Pacific Ocean. In one instance, a group of about 400 porpoises accompanied a school of tuna estimated at 200 tons. This association has led to a study on the behavior and ecology of porpoises in an effort to widen understanding of the yellowfin tuna resource, which is the mainstay of the United States Pacific tuna fleet.

ALASKAN QUAKE CAUSED HISTORY'S GREATEST UPLIFT

The Good Friday (March 1964) earthquake in Alaska was so strong that it caused the greatest uplift of land ever recorded in history, a rise of more than 50 feet in the ocean floor of the Gulf of Alaska, the Director of the Coast and Geodetic Survey (C&GS), U. S. Department of Commerce, announced November 20, 1964.



A hydrographic survey completed during the summer 1964 by the Coast and Geodetic ship Surveyor disclosed that a large area of the sea floor was uplifted in excess of 30 feet, with a maximum rise of more than 50 feet in three areas. This was determined by comparison with a similar C&GS survey in 1927.

The sharp rise in the ocean floor took place in the area between Kodiak and Montague Islands, not far from Prince William Sound, where the March 27 earthquake was centered. The disaster killed 114 persons and caused an estimated \$750 million in damage.

The uplift in the ocean floor resulting from the earthquake was considerably greater than the maximum rise of 31.5 feet previously reported for Cape Cleare, Montague Island. The greatest uplift in history previously reported was 47½ feet at Bancas Point in Disenchantment Bay, Alaska, following the 1899 Yakutat Bay quake.

Still other studies conducted by the C&GS following the March 27 earthquake revealed:

1. That the earth shifted horizontally 15 to 20 feet between Montague Island and Lattouche Island, according to a survey made by the C&GS ship Hodgson. Comparison with observations made in 1933 by the scientific agency revealed that the distance between fixed points on the two islands decreased by 15 to 20 feet as a result of the quake.
2. That along a valley on the Kenai Peninsula the mountains moved an average of five feet. This was ascertained by triangulation parties, which determine horizontal positions on the earth.

Leveling parties of the Coast and Geodetic Survey also checked vertical displacement of the earth in the same region. They found that the earthquake caused the earth to drop in the 400-mile area between Valdez and Seward. The subsidence ranged from 3.2 feet at Seward to 5.6 feet at Portage.

FISH MAKES MAJOR CONTRIBUTION TO NEW YORK CITY'S "ANTI-CORONARY CLUB" DIET

New York City's "Anti-Coronary Club" since 1957 has had as its objective the development of a practical, safe, and effective dietary approach to the prevention of coronary heart disease affecting western civilization, according to Dr. George Christakis, Director of Nutrition, New York City Board of Health. What follows is in part an address given by the Director to the Newspaper Food Editors Conference, New York City, October 5, 1964. The meeting was sponsored by the Fish'n Seafood Promotions Division of the National Fisheries Institute.

The New York City Health Department center on the east side of mid-town Manhattan is where the members of the "club" are interviewed, given an orientation lecture, then weighed and given a very complete physical examination, including laboratory tests, X-rays, and electrocardiograms. They are given an intense dietary instruction by the Bureau of Nutrition's public health nutritionists; their progress is then monitored by a panel of physicians every 5 weeks, at which time a serum cholesterol level is taken.

The cast of characters in this drama of human experimentation are 1,200 men, New Yorkers ranging in age from 40 to 59 and mostly in managerial and professional occupations. Approximately 800 of the men selflessly attend the "Anti-Coronary Club" during working hours and voluntarily disavow their usual diet habits in order to embark on a new nutritional way of life. With a twinkle of optimism, this new way of eating was nicknamed "The Prudent Diet." The remaining 400 men in the project are under observation while keeping to their usual diet habits; they serve as the "Anti-Coronary Club's" control group.

The important events in the scientific world which set the scene for the advent of the "Anti-Coronary Club" were:

1. The recognition that coronary heart disease is the number one killer of men in the United States.
2. Scientists studying the relationship between diet and coronary heart disease in many areas of the world found that the amount of coronary heart disease and the level of serum cholesterol of a population went hand-in-hand. The higher the level of cholesterol, the higher the death-rate from coronary heart disease; the lower the level of cholesterol the lower the heart attack death rate was in that population.
3. The discovery that the amount and type of fat in the diet could strongly influence the level of serum cholesterol. The more saturated fat in the diet, the higher the serum cholesterol level tended to rise; the less saturated fat, or the more polyunsaturated fat in the diet, the lower the serum cholesterol level dropped. Thus, saturated and polyunsaturated fats were found to have opposite effects on the serum cholesterol level.
4. The breakthrough by the U. S. Public Health Service-sponsored Framingham Study which identified the high serum cholesterol level as a major risk factor associated with coronary heart disease as this disease developed in Framingham, Mass., townspeople.

Against this back-drop of scientific advances, the ultimate task of the "Anti-Coronary Club" was to test the idea that a diet relatively low in saturated fat and high in polyunsaturated fat could lower serum cholesterol and thereby perhaps prevent coronary heart disease.

What is the "Anti-Coronary Club's" diet? The diet is a varied one with beef, fish, poultry, and veal prominently featured on the menu plan. Saturated fat intake is decreased by an avoidance of more than 16 ounces of beef, mutton, or pork per week. Butter, ice cream, and hard cheeses are replaced respectively by margarine rich in polyunsaturated fat, sherbets, and cheeses low in saturated fats. Rich desserts and pastries made with hydrogenated shortening are replaced by baked goods low in saturated fat content and made with polyunsaturated shortenings.

(Continued on next page)

A major contribution to the diet is made by fish, as fish are rich sources of polyunsaturated fats. At least 5 meals per week contain fish or other sea foods. Beef may be consumed 4 meals per week, and the remaining meals are comprised of poultry and veal. Vegetables and fruits also share a prominent place in the diet pattern. Cereals, vegetable oil, and nuts are also included. Eggs are limited to 4 per week.

The principles upon which the diet is based are two: (1) moderation in quantity of dietary fat; (2) balance of the types of fat.

The diet lowers the total number of daily calories derived from fat from about 42 percent as is present in the usual American diet, to 32 percent. It furthermore aims to balance the amounts of the three types of fat found in most foods. About two-thirds of the fat usually consumed is saturated. In the Prudent Diet this is reduced to one-third. Thus there are approximately equal numbers of calories contributed by the three types of fat: saturated, mono-unsaturated, and polyunsaturated. Saturated fats are mostly found in beef and dairy products. Mono-unsaturated fats are present in olive oil and margarines. Polyunsaturated fats are mostly found in fish, vegetable oils, and certain nuts...

What are the results of the "Anti-Coronary Club" to date? It has been demonstrated that members find the study diet palatable and acceptable enough to contrive consuming it for more than seven years. Moreover the diet has been effective in lowering serum cholesterol and keeping it low over an extended period of time.

In order to assess the nutritional adequacy of the diet in relation to vitamins A and E, recent investigations have affirmed normal serum levels of these vitamins in a sample of Anti-Coronary members. The effect of the study diet on serum triglyceride levels was also measured since this blood fat factor may also be related to coronary heart disease incidence. While the diet lowered cholesterol, it was found not to raise the triglyceride level.

Another research problem which faced us at the "Anti-Coronary Club" was finding a way to prove that the Club's members were actually consuming the foods they were taught to eat, and which they said they ate. We found that by taking a sample of their fat tissue and analyzing it chemically for individual fatty acids, we could trace the actual changes in composition of their own fat as they continued to consume the polyunsaturated fatty acids predominantly found in fish. Thus, at least as certain fish fats are concerned, "man is what he eats."

Observations suggest that the members of the "Club" appear to be having fewer heart attacks than would be expected.

But why does 30 to 40 percent of our adult male population have levels of serum cholesterol high enough to increase their risk of developing coronary heart disease? Why do our young men have rapidly rising levels of serum cholesterol from age 18 to 27? Might not these high levels of serum cholesterol reflect overintake of foods containing saturated fats, or underconsumption of foods rich in polyunsaturated fats? Or both? Other factors may also contribute to the high levels of serum cholesterol observed in American men, such as lack of exercise and psychological stress. However, the importance of diet in influencing the serum cholesterol level is so well documented as to urge that we take a critical look at how we, as a people, are eating. There is no nation that can surpass the advances being made by our food technologists. Nor any land that is blessed by a more bountiful national harvest. Much knowledge supplied by the nutrition sciences has already been incorporated in the American diet; this must not be violated. But the virtues of our present diet pattern should not be extolled so loudly that it is considered insusceptible to improvement.

Nutritional abundance should not be mistaken for nutritional excellence. Though faced with thousands of different food items in the supermarket which compete for her attention, the housewife must prudently choose the foods that will comprise a truly balanced diet. These include meats, fish, dairy products, vegetables, fruits, cereals, and oils. No food group, or groups, should be overconsumed to the exclusion of others. The housewife also has the responsibility of preparing these foods so attractively and deliciously that all food groups will meet with enthusiastic acceptance...



HIGHLIGHTS IN THIS ISSUE (APRIL 1965)



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SALMON--"Manmade" salmon runs may develop from large-scale plantings in virgin waters of California (page 14), Oregon (page 32), and the Great Lakes (page 21)

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Reports on Foreign Fisheries

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AUSTRALIAN FISHERIES TODAY--A comprehensive report spotlighting the dramatic rise of Australia's new fisheries--TUNA, SHRIMP, SCALLOPS, AND ABALONE--with an area-by-area survey of the new fishing grounds (pages 51-61)

CHILE: A NEW FISHING GIANT?--Large new fish meal capacity--but uncertainty about the anchoveta resource clouds the outlook (page 64)

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THE SOVIET UNION: DRIVING EXPANSION IN FISHERIES--Catch target for 1965 boosted to 5.6 million tons as giant new factoryships and trawlers are delivered to the Soviet fleet by shipyards in Denmark, Japan, and the U. S. S. R. (pages 85-87)

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Fishes

COMMERCIAL FISHERIES REVIEW



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Fish and Wildlife Service
Bureau of Commercial Fisheries
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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U.S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

5/31/68

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COMMERCIAL FISHERIES REVIEW

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SOVIET AND JAPANESE FISHING ACTIVITY OFF ALASKA IN 1964

By Ronald C. Naab*

BACKGROUND

The massive build-up of foreign fisheries in international waters off Alaska continues. Last year well over 1,000 of the world's most modern fishing and auxiliary vessels from Japan and the Soviet Union ranged in the offshore waters along Alaska's vast coastline, catching millions of tons of fish and whales.

Several years ago as those foreign fisheries began to expand, the U. S. Bureau of Commercial Fisheries and the U. S. Coast Guard initiated cooperative patrols off Alaska. Coast Guard ships and aircraft capable of prolonged high-seas patrol are accompanied by Bureau agents who provide specialized fisheries knowledge. These cooperative patrols are augmented by one Bureau of Commercial Fisheries patrol boat which concentrates on areas closer inshore. The patrols enforce provisions of several international fisheries agreements and also gather information on foreign fisheries which are not subject to current agreements. Information on extra-treaty foreign fisheries is essential to determine their impact upon United States interests.



Fig. 1 - Trawl being hauled up the stern ramp of a 260-foot Japanese factory trawler in the eastern Bering Sea. The Japanese are rapidly adding to their fleets more of these highly capable ships which catch and process fish without need of accompanying factoryships.

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U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 732

The cooperative patrols have been bolstered each year to keep pace with the expanding foreign fisheries. In 1964 five Coast Guard cutters and the Bureau's John R. Manning covered 60,000 miles on fisheries patrols of the eastern North Pacific and Bering Sea. The surface patrol units were augmented by nearly 150,000 miles of long-range aircraft patrols from Coast Guard Air Stations.

JAPANESE OPERATIONS

About 700 vessels were dispatched from Japan in 1964 to engage in fisheries of interest to United States, especially Alaska, fishery interests. Included were the Japanese high-seas salmon fishing fleets composed of 11 factoryships and 369 accompanying gill-net vessels.

FISH MEAL AND OIL FISHERY: The Japanese fish meal and oil fleets in the eastern Bering Sea last year consisted of five factoryships accompanied by nearly 150 trawlers. The first of those fleets appeared north of the Pribilof Islands in mid-April and by the end of May all five fleets were working in the eastern Bering Sea. A gradual northwest movement began in June and by the end of July the fleets had moved to the western Bering Sea. They remained off Siberia until late August when they again returned to the eastern Bering Sea for a short period, completed their catch quotas, and returned to Japan in early September.



Fig. 2 - The deck of a Japanese factoryship is covered to a depth of several feet with flounder and sole caught in the eastern Bering Sea near Bristol Bay. Fleets of trawlers deliver their catches to the factoryship, where the fish are reduced to meal and oil within a few hours. Workers selecting larger fish which are frozen for human consumption wear snowshoe-like boards on their feet to keep them from sinking into the mass of fish.

KING CRAB FISHERY: The 1964 Japanese king crab fishery off Alaska was composed of two factoryships, each accompanied by six tangle-net setting vessels. Each factoryship carried aboard about eight small boats used for hauling and picking the tangle nets. The king crab fleets arrived north of the Alaska Peninsula in March and remained in that general area until fulfilling their catch quotas in September of 235,000 cases of canned crab meat.

SHRIMP FISHERY: A shrimp factoryship with 12 accompanying trawlers operated in the eastern Bering Sea essentially throughout 1964. During the winter period when ice conditions prevented operations in the proven shrimping areas north of the Pribilofs, the fleet moved south to near Unimak Pass and fished primarily for Pacific ocean perch. A second shrimp factoryship, also accompanied by 12 trawlers, joined the fishery in April and operated generally north of the Pribilofs. The fleet departed for Japan in September.

HALIBUT AND SABLEFISH FISHERY: The Japanese employed seven long-line fishing vessels, one of which also served as a processor, in the halibut fishery of the eastern Bering Sea in 1964. They fished in the controversial Triangle area when the season opened in March and, just as did the North Americans, found their halibut catches extremely low. The Japanese shortly shifted their efforts to other species, primarily sablefish and rockfish. This alternative also proved fruitless and by late April the Japanese long-line fleet abandoned the eastern Bering Sea and moved to grounds off Siberia. They did not return to the areas off Alaska.

An unexpected development this past year was the appearance of seven Japanese long-line fishing vessels in the Gulf of Alaska in the vicinity of Kodiak Island. It was found that those vessels were making excellent catches of sablefish, with some rockfish. There were no indications that salmon or halibut were caught.

The Japanese Government requires that vessels be licensed to fish in the Gulf of Alaska. Information on the Japanese vessels licensed to fish off Alaska revealed the long-line vessels were not authorized to operate in the Gulf of Alaska. Complete information on these vessels was forwarded through appropriate channels to the Government of Japan for its consideration and appropriate action.

WHALING: The level of Japanese whaling in the eastern North Pacific in 1964 was the same as in the past few years. Their fleets were comprised of three whale factoryships, each accompanied by seven whale killer vessels. Japanese whalers were active from late May into August and roamed from the western Aleutians to waters off southeast Alaska.

SALMON FISHERY: The Japanese high-seas salmon fishery in 1964 included 11 factoryships with 369 gill-net fishing vessels. The fleets deviated considerably from past patterns of operation, reportedly because of low catches. In the latter part of July and early August at least one fleet moved into the area near Adak close to the International North Pacific Fisheries Convention salmon abstention line of 175° West Longitude.

GULF OF ALASKA FISHERIES: In 1964 the Japanese licensed six trawlers to operate in the Gulf of Alaska. Included were 4 factory stern trawlers which fished primarily for Pacific ocean perch and 2 smaller side trawlers which fished for shrimp. The stern trawlers ranged from near the Shumagin Islands eastward to about Middleton Island, while the side trawlers concentrated in a limited area off southwest Kodiak Island. The first of the trawlers appeared in the Gulf in May and all ended operations by the end of October. Bureau of Commercial Fisheries observers accompanied 3 of the stern trawlers to gather biological data on the effects of their trawling upon halibut and king crab.

U.S.S.R. FISHERIES

Soviet fishing efforts off Alaska were increased for the fifth consecutive year in 1964 and expanded into new species and areas. More than 500 Soviet vessels were associated with the fisheries of the Alaskan area.

HERRING FISHERY: One of the major Soviet fisheries for the past few years has been their winter trawling efforts for herring, generally north and west of the Pribilof Islands. In 1964 that fishery began in January and by early February it included more than 150 Soviet vessels. The herring fleet continued at about the same level until April, when they dispersed to other fisheries, reportedly because of adverse sea ice conditions.



Fig. 3 - Massive Soviet fishing fleets operate off Alaska throughout the year. During the winter, their trawling fleets fish along the edges of the ice pack in the eastern Bering Sea and move deeper into the pack to obtain shelter from the severe storms common in the area.

PACIFIC OCEAN PERCH FISHERY: As in past years, the Pacific ocean perch stocks off Alaska were a major objective of Soviet fishing efforts in 1964. The first of the ocean perch fleets appeared in the Gulf of Alaska off Yakutat in March when the herring fishery in the eastern Bering Sea began to disperse. By May the number of vessels involved in that fishery exceeded 150 and they were operating in the area from Albatross Bank southwest of Kodiak to off Yakutat in the eastern Gulf of Alaska. The strength of the ocean perch trawl fleets began to decline in June, reportedly due to the diversion of vessels to a highly productive saury fishery off Siberia, and by October the fleets numbered fewer than 20 vessels. Contrary to their operation in past years, the Soviets did not withdraw their fleets from the Gulf of Alaska with the onset of adverse winter weather but maintained a trawl fleet of 15 to 25 ships in the general area off Yakutat throughout 1964. The effort devoted to ocean perch marked the first time the Soviets maintained a fishery in the Gulf of Alaska during the treacherous winter period.

KING CRAB FISHERY: In 1964 the Soviets used three ultramodern factoryships in the king crab fishery near Alaska. Each of the factoryships was accompanied by three tangle-net setting trawlers. Two scouting trawlers explored for the fishery. Each factoryship carried 12 small boats from which the tangle nets were picked. The Soviet king crab fishery in 1964 operated in the outer Bristol Bay flats area from near Port Moller to Unimak Pass during the period April through July, when the fishery was ended. One of the crab factoryships unexpectedly appeared near Chirikof Island southwest of Kodiak in early April. The Department of State immediately protested this king crab tangle-net fishery in the Gulf of Alaska. Within two weeks the factoryship had returned to the Bering Sea. There was no further Soviet king crab fishing in 1964 in the Gulf of Alaska.

WHALING: Last year four Soviet whale factoryships, accompanied by nearly 50 whale killer ships, harvested whale stocks near Alaska. The whalers appeared off Alaska in June and ranged from the western Aleutians to south of Alaska's panhandle until their withdrawal in October. An interesting development in 1964 was the operation of two whaling fleets near the Pribilof Islands during August and September.



Fig. 4 - A Soviet SRT-type trawler delivering its catch of Pacific ocean perch to a refrigerated ship where the fish are frozen and later transported to the Soviet Union. Soviet fishing vessels such as these are becoming a common sight in offshore waters along much of Alaska's vast coastline.

SHRIMP FISHERY: For several years the Soviets have voiced an interest in starting a shrimp fishery off Alaska. Unconfirmed reports indicate that a limited shrimp fishery was begun in 1963. In 1964 the Soviets definitely conducted a trawl fishery for shrimp off Alaska. In April of 1964 two large Soviet trawlers of a new type were observed shrimp fishing near the Pribilof Islands in the same region now traditionally fished by the Japanese shrimp fleets. That fishery was apparently ended by June. However, in late October two more of those new trawlers were observed fishing shrimp southwest of Kodiak, an area also fished for shrimp by the Japanese. This Soviet shrimp fishery off Kodiak was terminated in December.

FOREIGN INTERFERENCE WITH U. S. FISHING ACTIVITIES

Continued expansion of the foreign fleets has brought them into areas where they overlap with United States fisheries and has periodically resulted in interference with our fisheries. This interference is of two general types: damage or loss of U. S. fishing gear caused by foreign vessels and denial of fishing areas to U. S. fishermen caused by the presence of large numbers of foreign vessels on desirable grounds. Thus far the Alaskan king crab and halibut fishermen who operate fixed fishing gear far offshore have felt the brunt of the foreign fleets on the high seas.

All reported interference with U. S. fishing activities by foreign fishing vessels in 1964 occurred in the Gulf of Alaska, primarily in the region off Kodiak. Six such incidents were reported by halibut fishermen and most of their complaints were directed at Soviet trawlers. A frequently voiced problem was the occupation by Soviet fleets of established halibut fishing grounds. The Russian trawling fleets have found the edges of Fairweather, Portlock, and Albatross Banks productive for Pacific ocean perch. Quite often our halibut fishermen, upon reaching those grounds, have considered it foolhardy to set their gear amid a mass of trawlers, for loss of gear appeared unavoidable.

Foreign interference with our growing king crab fishery was considerably reduced in 1964. A total of 29 U. S. king crab pots were reported lost to foreign fishing vessels during the year in contrast to over 100 pots reportedly lost in 1963. The losses of 12 pots were attributed to Japanese vessels, 7 pots were charged to Soviet vessels, and the other 10 pots could not be attributed with certainty but were believed lost because of Japanese vessels operating in the area.

The severe curtailment of king crab fishing efforts because of the March 27 earthquake damage in Kodiak no doubt reduced the potential for such conflicts. However, another major factor was the apparent avoidance by the Soviets of the areas of king crab pot concentrations. Following formulation of the United States-Soviet gear conflict agreement in late June, Soviet trawlers apparently refrained from fishing in the designated crab pot areas off Kodiak, although the agreement did not enter into force until late last year. In fact, the only pot losses charged to the Soviets occurred within a pot sanctuary area off Kodiak in November--after the agreed upon pot protection period of July through October.

Japanese trawlers, on the other hand, consistently fished within the pot concentration areas as designated by the United States-Soviet agreement, primarily off southwest Kodiak Island. All the pot losses charged to the Japanese occurred within the areas and period designated by the United States-Soviet pact. Of interest were the arrangements made by the Taiyo Fishing Company, through an Anchorage subsidiary, to compensate United States fishermen for king crab pots lost to Japanese trawlers in the Gulf of Alaska.



Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

THE TRADE EXPANSION ACT AND THE KENNEDY ROUND^{1/}

By Louis C. Krauthoff II*

This year Americans will turn out more than \$600 billion worth of goods and services. And if our projections are correct, within 15 years our economy will turn out \$1 trillion worth of products--allowing for just a normal growth rate. In the last 15 years, world trade has tripled and is growing at a substantially faster rate than our own internal economy. Today, United States exports are running at the rate of over \$22 billion annually and more than 4.5 million Americans depend directly on international trade for their jobs. Imports are running at the rate of over \$18 billion leaving us a trade surplus of around \$3.6 billion--excluding military aid expenditures.

I am not trying to overwhelm you with statistics, but I am eager to make the point that the figures are encouraging. Because of the dollar's special position as one of two key currencies and the pivotal dollar-gold relationship to international liquidity, the average man in the street hears a great deal more about our balance of payments deficit, than our very comfortable trade surplus.

Let me state the foreign trade figures in a different way. The United States exports about 20 percent more than we import. It is this favorable balance of trade which is at present helping to support U. S. foreign policy abroad and that is very directly connected with our 30-year campaign to "reduce tariffs" referred to by President Johnson in his Economic Report to the Congress last year. The early cornerstone of this campaign was the Reciprocal Trade Agreements program which was fathered by Cordell Hull in the depths of the great depression when the value of world trade had dropped by two-thirds, strangled by the combined effects of worldwide depression and mounting trade barriers. Our own country had been especially hard-hit because our share of world trade declined even more than the average. Thus, in 1934, we assumed leadership in a program for worldwide reduction of tariffs on a reciprocal basis. The result was that, leaving aside the free list, the average duty paid on imports was reduced from over 50 percent in the early 1930's to around 11 percent in 1960.

United States initiative and trade liberalization which has done so much to strengthen the free world culminated in the passage of the Trade Expansion Act in 1962. We are entering the most important phase of the trade negotiations made possible by that Act. These are being called the Kennedy Round of negotiations and are being conducted in Geneva under the auspices of the General Agreement on Tariffs and Trade--commonly called the GATT. In the current negotiations the United States is seeking linear tariff reductions on broad categories of industrial goods which will be coupled with the negotiations later on in the year on agricultural products. Briefly, the economic basis for the U. S. search for broad tariff reduction is:

1. U. S. jobs depend on world trade.
2. U. S. farm products need foreign markets.
3. U. S. industry needs exports.
4. Since prosperous industrialized nations are the best customers for U. S. exports, it is in our long-run interest to foster the growth of the newly emerging nations by trading with them and accepting their trade.
5. Foreign trade is vital to U. S. security.

*Chairman, Trade Information Committee, Office of the Special Representative for Trade Negotiations, Executive Office of the President, Washington, D. C.

^{1/}Address before the National Menhaden Association, Old Point Comfort, Va., Feb. 23, 1965.

6. Expanded foreign trade is essential to an expanding economy in the U. S.
7. Exports tend to cushion U. S. economic recessions.
8. If we are inhospitable to receiving the goods of other nations--especially the emerging and uncommitted nations--they are likely to turn to the Sino-Soviet bloc for the trade (and other ties).
9. A liberal trade policy toward the recipients of our foreign aid is imperative to help them (a) stand on their own feet and (b) repay our aid loans ultimately.
10. The freer the trade, the better the allocation of resources.
11. Imports give the consumer a break by providing a greater variety of products and cheaper products.
12. Imports are necessary to furnish the dollars other countries need in order to buy our exports.

These negotiations will be the most important and comprehensive trade negotiations ever held. More countries are taking part in them than ever before--and the field they cover is extremely wide, including not only industrial but agricultural and primary products and not only tariffs but nontariff barriers as well.

One reason the President was given the important tariff-cutting authority in the Trade Expansion Act--and hence the main thrust of the present Kennedy Round--is to give our country some leverage in negotiating down the Common External Tariff of the European Economic Community. The economic importance of the emergence of the EEC as a single trading unit would be very dangerous for us to underestimate. "No army," wrote Victor Hugo in post-Napoleonic Europe, "can withstand the strength of an idea whose time has come." Great armies have marched across Europe, attempting to enforce unity under hegemony of Imperial Rome, revolutionary Paris, the Holy Roman Empire, and most recently, Communist Moscow. Religious crusaders, too, have tried to impose upon diverse peoples and cultures a common "European" consciousness. Yet any European unity born of coercion, shortly disintegrated.

Today, however, Europe west of the Iron Curtain is moving toward unity, propelled by an idea backed voluntarily by free men and nations, and warmly supported by the United States. France, West Germany, Italy, Belgium, Luxembourg, and the Netherlands, organized as the European Economic Community (EEC), are steadily reducing trade restrictions among themselves toward the eventual goal of completely free movement of men, goods, and capital, and are erecting a common tariff wall against outsiders. It is already a pretty safe bet to hazard a guess that the Treaty of Versailles in 1918, which failed to change much that was fundamental to Old Europe, will not be as long remembered by schoolboys of the 21st century as the Treaty of Rome which brought into being this new European Common Market.

As the year progresses, you will be reading more and more about the Kennedy Round in your newspapers even though some of it may be buried close to the bond section on the business page.

Last Thursday there was a good editorial in The New York Times that forecast our summer negotiating outlook as "long and hot" followed by even tougher negotiations in the fall. The paper congratulated us on our patient approach, which Governor Herter's office feels is so essential, since the significance of the negotiations transcends guilders and dollars, pounds, francs, or deutschmarks. If we succeed, we can lay a solid economic foundation for an enduring partnership for peace and progress, embracing not only the Atlantic nations but the developing countries of Asia, Africa, and Latin America. If by any chance we fail, I fear that we may leave the Atlantic nations dangerously divided into rival trade blocs, and we may gravely and perilously disappoint the developing nations in their desire to earn, through expanded trade, more of the resources they urgently need for their development.

You may have read recently about some of the strains and stresses of the recently finished "Confrontation and Justification" exercise in relation to the main GATT partners' exceptions lists. Also, there have been stories about Governor Herter's recent trip to Geneva and Brussels in his continuing attempt to persuade the EEC to adopt a more flexible policy in their approach to agricultural negotiations. These represent almost predictable ups and downs in the international trade bargaining pattern. It will be continually important to remember that the turbulence so evident on the surface of the trading world in recent months, although severe, is not altogether unusual nor can it be expected at any time to subside entirely. This is, after all, a period of profound change marked by the efforts of Europe to move to a new identity, a new institutional structure, and a new set of relations among its several parts and with the outside world. As this process unfolds, it is natural to expect divergent and contending views as to the role, identity, and nature of the new Europe.

The developments in the EEC have a real interest for your industry. As most of you know the Community has recently been taking a substantial portion of your menhaden oil exports for use in margarine and soap manufacture.

In 1962, 44 percent went to the Community directly, and 46 percent went to the United Kingdom, Sweden, and Norway, members of the other regional trading group in Europe known as the European Free Trade Association (EFTA) who are also involved in the Kennedy Round. Although the exports to the EEC went down in 1963, the EFTA share went up, especially that of the United Kingdom--and, more importantly, so did prices.

The EEC also absorbs large exports of fish meal from Chile and Peru which might otherwise overhang your own now fairly stable market for fish meal in the United States. So interests in the new Common Market cannot be lightly written off.

Despite the fact that last year was the worst year the menhaden industry has had since 1958 in terms of volume of catch, overall exports for the first 11 months were above average. I am sure you would like to obtain reductions in the duties on menhaden oil from the 17.5 percent in Canada and the 10 percent in the United Kingdom and would share our alarm if there were any sign of a duty being imposed by the EEC. Also, I know you want our negotiators to bear in mind what heavy import years like 1962 can do to the stability of the structure of the domestic market, particularly on the West Coast.

Let us now turn our attention to the more general aspects of the Trade Expansion Act which set the stage for the Kennedy Round which is just getting under way in Geneva. The Act created the post of a trade czar who was to be called the Special Representative for Trade Negotiations. Governor Herter was appointed to this post and today chairs a Cabinet-level Committee, the Trade Expansion Act Advisory Committee (TEAAC). He has a staff of 27 on which I serve. The preparations for the negotiations started in earnest in December of 1963 with simultaneous public hearings before the Tariff Commission and the Trade Information Committee, an inter-agency Committee. During the four months of these hearings, hundreds of briefs were submitted and hundreds of witnesses made personal appearances--most of them, of course, representing industrial interests. I should like to express at this time my great appreciation for the thought and effort which many industries devoted to the preparation of their briefs and their testimony. Your own menhaden interests were most ably represented before the Trade Information Committee.

All of this information was digested and analyzed by the Government agencies concerned. It was supplemented by special studies, some of them very extensive indeed, conducted by our Office or by other Government agencies. Thus, when the process of formulating the U. S. exceptions list began within Government, it was against a background of factual information that was both wide and deep.

This process continued with the Trade Staff Committee, an inter-agency Committee chaired by a representative of our Office. Seven Departments were represented on this Committee by senior members of their staffs--Commerce, State, Agriculture, Labor, Interior, Defense, and the Treasury, plus a non-voting representative of the Tariff Commission.

Recommendations then go on through higher levels with the relevant government agencies involved through the constant coordination and guidance of Governor Herter or his staff. Thus our negotiating positions vis-a-vis our trading partners are very carefully arrived at and involve literally hundreds of experienced Government officials as well as representatives of the business community.

There will be more U. S. business involvement in the Kennedy Round than in any previous tariff negotiations. Indeed, the Trade Expansion Act specifically requires us to seek information and advice from representatives of industry, agriculture, and labor. To fulfill the letter and spirit of this legal requirement, two major steps have been taken.

First, the President has appointed, upon Governor Herter's recommendation, a Public Advisory Committee on Trade Negotiations, consisting of 45 prominent citizens--leaders in industry, agriculture, labor, the professions, and consumer affairs. As you know, the Executive Secretary of the National Menhaden Association is a member of this Committee. Members of this Committee serve as individuals rather than as representatives of their special fields of interest. They have met a number of times so far and meet again March 4. On each occasion they have received an up-to-date briefing on the progress of the negotiations and have been consulted on the most important pending policy questions. We have benefited very much from these give-and-take discussions, and I hope that the members of the Committee feel that they have as well.

Second, a Roster of Technical Specialists drawn from industry, agriculture, labor, and consumer organizations has been established. Their chief function will be to provide our negotiators with factual information (economic, technological, marketing, et cetera) that is relevant to the negotiations.

When we need specialized information in any given field to supplement or update the large amount of information already gathered by our office through the public hearings and from other Government agencies, we shall ask the technical specialists concerned to provide it. As you may know, the General Manager of the National Fisheries Institute is one of our ten technical specialists in the fish industry. Three other gentlemen recommended by the Institute are also on our Roster.

In concluding, I should like to make a guess that the negotiations which I have been discussing will take another year or more to complete. Our main focus will be achieving reciprocity or a balanced agreement among the participants. Although reciprocity is a rather nebulous concept for which there are no precise standards, the negotiations will involve the shortening and lengthening of exceptions and offer lists until, finally, countries are satisfied, in the context of the overall negotiations, that a satisfactory "deal" has been made.

We are prudently optimistic that the negotiations will be a success. Despite the past and prospective crises in the Kennedy Round, it appears that no country really wants the negotiations to fail. Their failure would have more than economic consequences. Not only would the opportunity for the world's most extensive liberalization of trade barriers be missed, but a severe blow would be dealt to hopes for strengthening the Atlantic partnership.

It is not claimed that the Kennedy Round will solve all our problems but it is a good framework to advance the solution of many international economic ones. All the free world problems cannot be solved this year or the next. But we must continue to try for equitable solutions. Haggling is better than fighting. The doctrine of comparative advantages assures us that it will mutually benefit participating nations in foreign trade. As President Kennedy liked to say, a rising tide lifts all boats.



TRENDS AND DEVELOPMENTS

Alaska

FOREIGN FISHING ACTIVITIES OFF ALASKA:

U.S.S.R.: The Soviet trawl fleet off Yakutat increased steadily during February 1965, from about 15 to more than 100 vessels. The rapid build-up of Soviet fishing activities along the Yakutat coast can probably be attributed to curtailment of fishing activities in the Bering Sea because of heavy ice-pack conditions, and insufficient catches for vessels to attain pledged quotas.



Fig. 1 - Soviet (BMRT) stern trawler offshore of Kodiak, Alaska, in May 1964.

Soviet vessels were observed in mid-February trawling for flounder and sole in outer Bristol Bay northeast of Port Moller. The number of vessels operating in that fishery was believed reduced somewhat by the end of the month.



Fig. 2 - Soviet refrigerated fish transport in Gulf of Alaska, June 1964.

By the end of the month it appeared that the Soviet herring fishery in the Bering Sea, which involved over 100 vessels in the early part of February, had been completely abandoned and the fleet redeployed for species other than herring.

Japan: The Japanese factoryship Chichi-bu Maru, accompanied by some 12 trawlers, continued to fish for shrimp on the grounds north of the Pribilof Islands during February. It was believed the Japanese had four large stern trawlers fishing in the eastern Bering Sea. Those vessels were reported as the Aso Maru, Akebono Maru's No. 71 and 72, and the Taiyo Maru No. 82; all operating in the vicinity of Unimak Island. No Japanese vessels were seen in the Gulf of Alaska during the month.

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TWO NEW KODIAK KING CRAB PLANTS IN OPERATION:

The two new king crab plants at Kodiak were operating full time in February and helped relieve the supply situation to some extent, but many of the fishermen were still having trouble finding ready buyers for their crabs. Some vessels were laid up for as long as two weeks at the dock with full loads of king crab unable to find a buyer. Mortality was high on crabs held in vessel tanks. Fishermen on the south end of Kodiak Island run as far as Seldovia to make delivery. The increased processing facilities for about 9,000 crabs a day developed just in time to see meat recovery fall off as the crabs began to "go light," particularly from the south-end fishery. Many fishermen planned on quitting in another 2 or 3 weeks.

* * * * *

SHRIMP-PROCESSING OPERATIONS AT KODIAK INCREASE:

A shrimp-processing firm in Kodiak started several months ago a second 10-hour shift



Fig. 1 - Shrimp being transported from landing dock to processing plant.

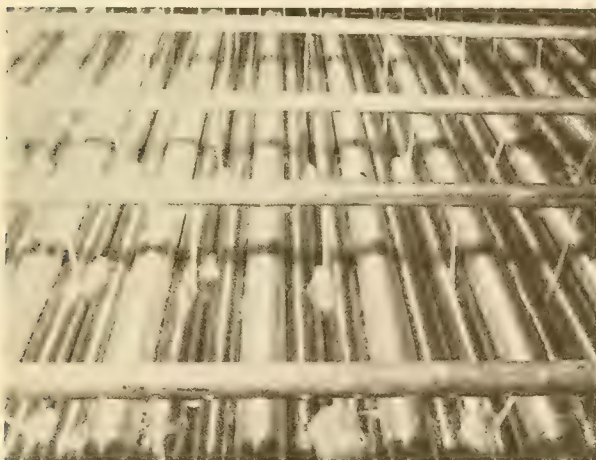


Fig. 2 - Pink shrimp being machine-peeled in an Alaska processing plant.

working in the plant it leased. In addition, arrangements were made to lease and use the four shrimp peelers installed on the upper floor of another plant. The machines in February were expected to be operating by the last half of March.

* * * * *

JAPANESE FIRM INTERESTED IN ALASKA HERRING PRODUCTS:

A prominent Japanese fishery firm completed negotiations in February 1964 with an Alaska firm to buy 1,200 tons of large frozen herring. The herring will be shipped to Japan where the roe will be removed and the fish processed for human consumption.

A Hawaiian company and a Japanese importing firm have also expressed interest in buying brined herring roe as a result of samples of that product extracted from herring caught in spring 1964 and frozen until the end of the year at Kodiak. A 12-percent recovery rate on herring roe from a random lot of fish frozen for bait in spring 1964 was reported by a Kodiak firm.



Blue Crabs

SEMIAUTOMATIC CLEANER-DEBACKER MACHINE:

A semiautomatic machine that cleans and debacks whole cooked blue crabs has undergone successful in-plant trials, announced the U. S. Bureau of Commercial Fisheries Regional Office, Gloucester, Mass. The machine was designed and built by the American Scientific Corporation, Alexandria, Va., under a contract with the U. S. Bureau of Commercial Fisheries.



A semiautomatic machine that cleans and debacks whole cooked blue crabs.

When in operation, the machine, described as a semiautomatic cleaner-debacker for blue crabs, produces "heart-shaped" cores and exposes the lump and flake meat for ready removal. During the in-plant trials, the machine was operated by three commercial crab pickers who also picked the lump and flake meat from the machine cores. Studies comparing the yield from regular whole crabs versus the yield from the machine cores were conducted. The evaluation of data from the studies is still under way; however, the results will be available for area demonstrations.

Area demonstrations of the machine are being scheduled. Plans are that the demonstrations will take place in the Gulf, South Atlantic, and Chesapeake Bay areas. Notification of the dates, times, and locations of the demonstrations will be made later. The demonstrations are open to interested parties.

Further information about the cleaner-debacker machine can be obtained by writing to the U. S. Bureau of Commercial Fisheries Technological Laboratory, College Park, Md.



California

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 64-A-9-Pelagic Fish (November 27-December 15, 1964): The objectives of this cruise by the California Department of Fish and Game research vessel Alaska in the coastal waters of central California from Point Reyes to Point Conception were to: (1) survey the fish and invertebrates of the inshore pelagic environment; (2) assess the distribution, abundance, density, age and size composition, and recruitment of pelagic fish populations; and (3) collect live specimens for blood-genetic studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory, La Jolla, Calif.

Midwater trawl and nightlight blanketnet stations were the principal survey methods used. Large numbers of jellyfish and salps in areas north of San Simeon prevented trawling and as a result a complete survey was not possible there. Nightlight blanketnet stations were occupied extensively in that more northern area, but these are generally less

productive than midwater trawl stations and are not directly comparable with them. Very stormy weather prevented any coverage between San Simeon and Morro Bay.

A total of 39 light and 3 trawl stations were occupied north of San Simeon (the trawl net was badly torn at one station when it became overloaded with jellyfish). Ten light and 13 trawl stations were completed south of Morro Bay. A total of 235 miles was scouted while running between stations at night.

NORTHERN ANCHOVIES: As on all cruises conducted in 1964, anchovies (Engraulis mordax) were the principal species taken. They were caught in 12 of 13 midwater trawl tows south of Morro Bay and 2 of 3 tows to the north. In contrast, they were caught at only 1 of 10 light stations south of Morro Bay and at only 4 of 39 to the north.

Midwater trawl catches were generally small, with only 2 of them exceeding 500 fish. But one of the them yielded 16,500 fish weighing about 1,000 pounds.

Two of the 5 light-station catches were made between Point Sur and Cape San Martin, in an area where anchovies have seldom been seen or taken previously. A sample of those fish, and another from near Santa Cruz, were brought back alive for blood-genetic studies by the U. S. Bureau of Commercial Fisheries Biological Laboratory at La Jolla.

A sizable proportion of the anchovies caught were large fish. In several catches they ranged from about 135 to 155 millimeters (5.3 to 6.1 inches), and 15 of the 19 anchovy catches contained some fish over 140 millimeters (5.5 inches) long.

Only one anchovy school was identified during night scouting, and very few dense traces were seen on the precision depth-recorder; 20 unidentified schools were seen.

JACK MACKEREL: Four jack mackerel (Trachurus symmetricus) were caught at 3 stations. Two were juveniles measuring 57 and 101 millimeters (2.2 to 4.0 inches) and the others were subadults.

SARDINES AND PACIFIC MACKEREL: No sardines or Pacific mackerel were caught or observed on this cruise.

OTHER ACTIVITIES: A new instrument for determining the depth at which the net is fishing was used during this cruise. The instrument (a Furuno Net-Sonde) has a wireless system to transmit fishing depths from the net to the wheelhouse and provides a constant check on net depth while a tow is in progress. This instrument will play a vital role in sampling fish schools that are located with the Precision Depth Recorder.

Weather and sea conditions during the cruise were about as good as could be expected for that area and time of year. Two periods of unusually good weather allowed a more thorough light station coverage than had generally been possible. Sea surface temperatures ranged from 11.1°C . (52.0°F .) near Avila to 14.0°C . (57.2°F .) off Point Arguello. Surface temperatures averaged 12.3°C . (54.1°F .) north of San Simeon and 11.6°C . (52.9°F .) south of Morro Bay.

Note: See Commercial Fisheries Review, April 1965 p. 14.



Cans--Shipments for Fishery Products



January 1965: A total of 178,568 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January 1965 as compared

with 187,044 base boxes used during January 1964.

1964: A total of 2,752,126 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-December 1964, a decrease of 4 percent from the 2,874,534 base boxes used during 1963. The decline was due partially to a drop in the canning of Maine sardines and shrimp.

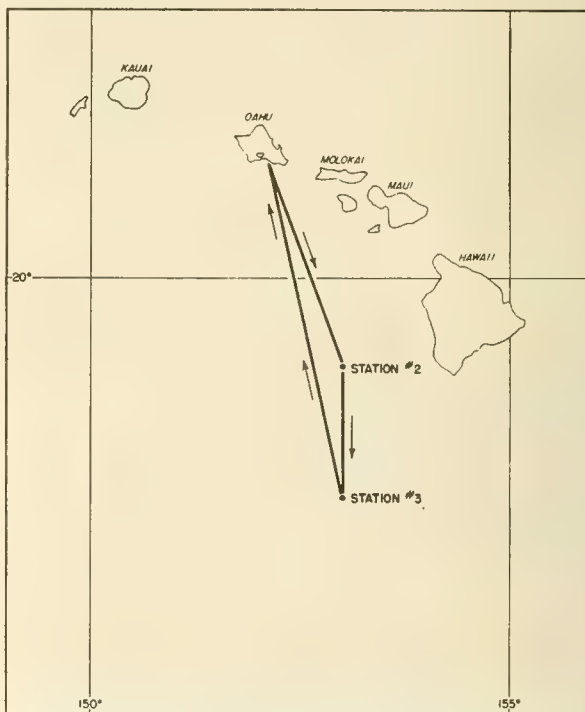
Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets $14" \times 20"$ size. Tonnage figures for steel (timplat) cans are derived by use of the factor 23.7 base boxes per short ton of steel. (In the year 1964 tonnage data were based on the factor 23.5 base boxes per short ton of steel; and in the years 1962 and 1963 tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.



Central Pacific Fisheries Investigations

EXPENDABLE BATHYTHERMOGRAPH EQUIPMENT TESTED:

M/V "Charles H. Gilbert" Cruise 78--Phase I (January 4-7, 1965) and Phase II (January 8-23): The objectives of this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii, were to: (1) test expendable bathythermograph (XBT) equipment from the vessel, (2) fish for live scombrids (mackerels), and (3) study currents in the Kaiwi Channel. The tests were made in collaboration with Stanford University and the manufacturers of the equipment.



Shows area of operations during Phase I of M/V Charles H. Gilbert Cruise 78 (January 4-7, 1965).

The area of operations during Phase I was between 19°N . and $17^{\circ}30'\text{N}$. along 157°W . where the Charles H. Gilbert made XBT tests in conjunction with the Bureau's oceanographic research vessel Townsend Cromwell (Cruise 12--January 5-24). While the Cromwell was making a hydrograph cast at station No. 2, the Charles H. Gilbert, at the same time, made 5 XBT drops at half speed and 11 drops at full speed within a 53-minute period at a distance of about 197 feet from the Townsend Cromwell. En route to Townsend Cromwell

station No. 3, six successful XBT drops were made concurrently with mechanical BT casts. During the Townsend Cromwell's oceanographic cast at station No. 3, four successful half-speed XBT drops and 10 successful full-speed drops were made in the time of 62 minutes within 531 feet of the vessel.

Operations during Phase II of the cruise were within 25 miles of Oahu. On 2 of the 6 days spent in fishing, 19 skipjack tuna, 5 yellowfin, 4 little tuna, and 1 frigate mackerel were caught. None was taken on the other 4 days. Two yellowfin tuna, suitable for density determinations, were caught by trolling. Five skipjack tuna snouts and 6 tongues were collected and preserved for histological study.

For an experimental study of currents in the Kaiwi Channel, a series of 21 optical targets (polyurethane sheets and paper) were released at 1-mile intervals between Laau Point, Molokai, and Koko Head, Oahu. The vessel then took a position in mid-channel while an aerial photographic survey from 10,000 feet was made of the target release area.

Note: See Commercial Fisheries Review, Feb. 1965 p. 16.

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TRADE WIND ZONE

OCEANOGRAPHIC STUDIES CONTINUED:

M/V "Townsend Cromwell" Cruise 13 (February 2-4 and 8-27, 1965): Measurements using the Hytech salinity-temperature depth (STD) in situ recorder for testing and calibration purposes were made by the research vessel Townsend Cromwell during two 1-day cruises, on February 2 and 4, 1965, at stations off Waianae, Oahu. The research vessel is operated by the Biological Laboratory, U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii.



Fig. 1 - The research vessel Townsend Cromwell.

On February 8 the Townsend Cromwell started the 12th cruise in a series of oceanographic cruises to collect data on rates of change in the distribution of properties in the trade wind zone of the North Pacific. The area of operations during that phase of the cruise was in the central North Pacific bounded by latitudes 10° N., 27° N., and longitudes 148° W., 158° W., where 43 oceanographic stations were occupied along the cruise track. At each station temperatures and samples for salinity analysis were obtained at 20 depths to 1,500 meters (4,921 feet). In addition, deep casts to 5,000 meters (16,404 feet) were taken at stations 21 and 25, and a cast to 4,000 meters (13,123 feet) was taken at station 40.

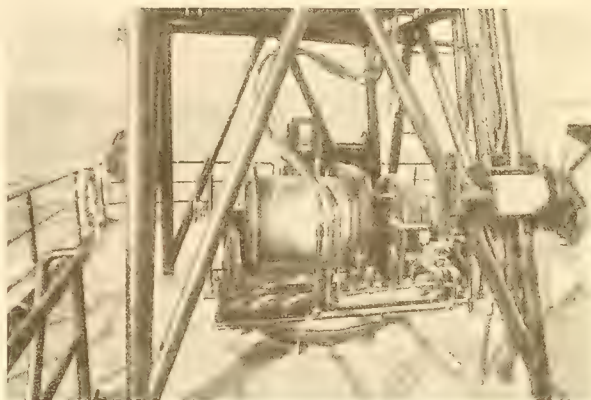
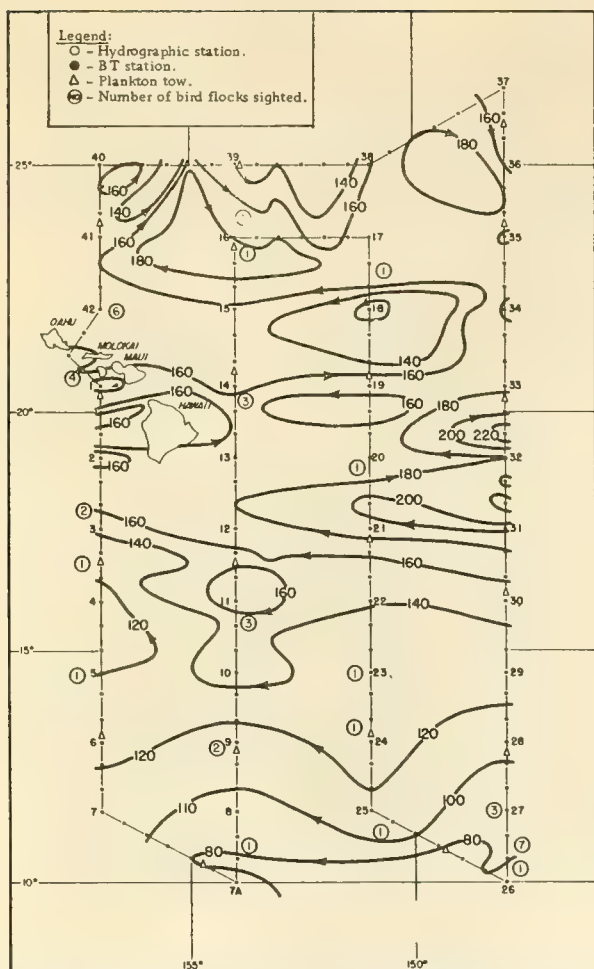


Fig. 2 - Part of the deck of the research vessel Townsend Cromwell.

Surface temperatures during the cruise showed that cooling continued to occur in the study area. This was most noticeable north of latitude 20° N. where it appeared that tongues of cool water were intruding from the northeast and northwest. The surface temperatures ranged from 21° C. (69.8° F.) in the northern sections to 25.5° C. (77.9° F.) in the southern sections. This compares with a similar range of 21.5° C. to 25.5° C. (70.7° F. to 77.9° F.) encountered during February 1964.

The February 1965 circulation pattern was similar to the previous month in January in that a more regular flow regime exists south of 18° N. while more complex patterns are seen north of that latitude. The February pattern differed mainly in that the southwesterly flow in the southern areas showed a more pronounced westerly component. The north-south gradient of isotherm depths were similar to the previous month's in all sections except the westernmost where a definite de-



Track chart of the research vessel Townsend Cromwell Cruise 13 (February 8-27, 1965), showing depth contours of the 20° C. isotherm in meters.

crease was seen, indicating a slackened flow. To the north, the cyclonic eddy within the island area seen during January, weakened greatly in February. However, a similar cyclonic eddy was seen north-east of the islands. In general this past February's flow pattern was different from last year's in that the westerly flow increased in intensity while the eddy systems decreased.

A total of 41 bird flocks were sighted during this cruise as compared with 30 during the vessel's previous cruise. Eight of the bird flocks were seen immediately north of station 26, where equatorial water of 34.0 ‰ was detected and a 1° rise in surface temperature to 25.8° C. occurred within 30 miles.

Other operations during the cruise included taking the usual series of bathythermograms, surface bucket temperatures, water samples for salinity analyses, release of drift bottles, and other oceanographic data collection.

The research vessel Townsend Cromwell was scheduled to leave her home base at Honolulu on March 8, 1965, for an oceanographic research cruise covering an area of over 600,000 square miles in the vicinity of the Hawaiian Islands. The 4,400-mile voyage is the 14th cruise of the 158-foot long vessel, commissioned in Honolulu in January 1964. Especially constructed for the Bureau's Honolulu Laboratory, she is one of the nation's largest and most modern oceanographic research vessels.

Except for one cruise, the Townsend Cromwell has been used exclusively for a study of Trade-Wind Zone Oceanography. One of the requirements of that study is monthly oceanographic and weather data from each of 42 locations in the Hawaiian Islands area. Each of those cruises takes 19 days.

The monthly trade-wind zone oceanographic cruises are scheduled to end in June 1965, when 16 months of data will have been collected. The Townsend Cromwell will then be used for other studies in connection with tuna and oceanography. These series of cruises are preliminary to a two-year, four-vessel operation planned for the future. The results will be of importance in the solution of many fishery and oceanographic problems.

Note: See Commercial Fisheries Review, April 1965 p. 19.



Chesapeake Bay

CHESAPEAKE BAY RESEARCH COUNCIL HOLDS FIRST ANNUAL MEETING:

Scientists from the Virginia Institute of Marine Science, the Chesapeake Biological Laboratory of the University of Maryland, and the Chesapeake Bay Institute of Johns Hopkins University met in late February 1965 at Annapolis, Md., for the first annual meeting of the Chesapeake Bay Research Council.

The purpose of the Council is to provide a framework for planning and carrying out cooperative research projects, and an effective means for exchanging information regarding

research projects under way in each member laboratory. Pressing demands for information needed to regulate the marine resources of Chesapeake Bay and the coastal waters of Maryland and Virginia have brought about rapid growth of the marine research agencies in the Chesapeake area.

Members of the Council are standardizing field and data treatment techniques in order to more easily interchange information. Compatible systems of data recording and processing will allow reports from one group to be transferred directly to the recording system of another group without having first to revise the data.

At the February meeting, scientists from the Chesapeake Bay Institute reported their hydrographic and nutritional studies in the upper Bay. Scientists from the Chesapeake Bay Laboratory outlined their Patuxent River thermal pollution study. The Virginia Institute of Marine Science delegates described results of hydrographic and ecological work conducted on the James River, and also discussed work being done for the U. S. Army Corps of Engineer to establish possible effects of spoil on bottom populations.

The new Council will meet annually and may hold interim meetings when necessary.

(Virginia Institute of Marine Science, Gloucester Point, March 10, 1965.)

Note: See Commercial Fisheries Review, Sept. 1964 p. 17.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-FEBRUARY 1965:

Fresh and Frozen: Purchases of fresh and frozen fishery products in January 1965 for the use of the Armed Forces were up 16 percent in quantity and 10 percent in value from the previous month. The increase was due mainly to larger purchases of shrimp, flounder fillets, and ocean perch fillets. Compared with the same month in the previous year, purchases in January 1965 were up 12 percent in quantity and 35 percent in value.

The increase in purchases in January 1965 was about offset by moderately lower purchases in February 1965 for most items.

Total purchases in January-February 1965 were up 20 percent in value from those in the same period of 1964, but the total quantity of the purchases was about the same in both periods.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, January-February 1965 with Comparisons

QUANTITY						VALUE					
January		February		Jan. -Feb.		January		February		Jan. -Feb.	
1965	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964
(1,000 Lbs.)						(\$1,000)					
2,370	2,108	2,036	2,300	4,406	4,408	1,465	1,088	1,311	1,231	2,776	2,319

Table 2 - Purchases of Principal Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, January-February 1965 with Comparisons

Product	January				February				Jan. -Feb.	
	1965		1964		1965		1964		1965	1964
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Quantity
	Pounds	Cents/Pound	Pounds	Cents/Pound	Pounds	Cents/Pound	Pounds	Cents/Pound	Pounds	Pounds
Shrimp:										
raw headless	89,700	97	83,500	80	94,700	97	99,400	79	184,400	182,900
peeled and deveined	103,080	137	73,850	109	51,080	135	110,900	109	154,160	184,750
breaded	361,400	89	284,800	66	242,020	89	345,500	63	603,420	630,300
molded and breaded	76,100	64	4,000	59	19,150	72	3,700	59	95,250	7,700
Total shrimp	630,280	95	446,150	76	406,950	96	559,500	75	1,037,230	1,005,650
Scallops	165,400	83	172,750	60	156,180	84	218,350	65	321,580	391,100
Oysters:										
Eastern	39,476	107	1/	1/	99,296	100	1/	1/	138,772	1/
Pacific	38,244	79	1/	1/	23,982	80	1/	1/	62,226	1/
Total oysters	77,720	93	130,154	93	123,278	96	127,364	91	200,998	257,518
Fillets:										
Cod	31,900	34	33,196	36	82,850	36	71,350	38	114,750	104,546
Flounder	388,450	32	529,744	29	236,000	37	328,072	33	624,450	857,816
Ocean perch	369,290	33	276,000	31	325,500	36	386,600	32	694,790	662,600
Haddock	126,100	39	130,594	40	145,900	38	221,000	39	272,000	351,594
Haddock portions	208,500	50	8,000	37	101,050	48	650	38	309,550	8,650
Steaks:										
Halibut	102,900	48	106,525	37	105,750	49	88,000	37	208,650	194,525
Salmon	5,000	72	13,157	65	9,490	65	10,410	66	14,490	23,567
Swordfish	540	59	800	51	320	61	1,900	48	860	2,700

1/Breakdown not available.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, January-February 1965 with Comparisons

Product	QUANTITY						VALUE					
	January		February		Jan.-Feb.		January		February		Jan.-Feb.	
	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964	1965	1964
	(1,000 Lbs.)						(\$1,000)					
Tuna	641	650	-	278	641	928	291	285	-	123	291	408
Salmon	1	679	5	-	6	679	1	416	4	-	5	416
Sardines	31	20	80	40	111	60	20	8	49	14	69	22

Average prices in 1965 were up for all the leading items, except cod fillets and haddock fillets. Prices were much higher for shrimp and scallops in 1965.

Haddock portions were purchased in much larger quantity in January-February 1965, but the increase was offset by lower purchases of flounder fillets, haddock fillets, oysters, and scallops.

Freeze-Dried: Purchases for the Armed Forces in January 1965 included 1,024 pounds of freeze-dried shrimp valued at \$12.59 a pound.

Canned: Tuna and sardines were the main canned fish items purchased for the Armed Forces in January-February 1965.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, Mar. 1965 p. 29.

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VETERANS ADMINISTRATION REQUIREMENTS DURING 1965:

Following are the estimated requirements of the Veterans Administration for fishery products to be procured in 1965:

Item	Case Size	Quantity
Canned:		Case
Salmon:		
Medium red or coho, with skin and backbone	48/1-lb.	1,200
Pink	48/1-lb.	2,000
Red or sockeye	48/1-lb.	3,100
Coho, dietetic	48/1/2's	2,200
Sardines, veg. oil, Grade A (22 to 32 per can)	48/15-oz.	1,200
Tuna:		
Lt. meat, chunk style, packed in veg. oil	12/64-oz.	5,900
Lt. meat, solid pack, lge. pieces, dietetic	48/1/2's	2,300
Shrimp, freeze-dried (peeled, headless, precooked):		
Large	6/No. 10's	400
Pieces	6/No. 10's	600
Frozen:		
Cod fillets, skinless	4-5-oz.	28,188
Flounder (sole) fill., skinless	4-5-oz.	59,088

(Table continued next column.)

	Size	Lbs.
Frozen (contd.):		
Haddock fillets, skinless	4-5-oz.	52,740
Halibut steaks, 7/8-inch thick (+ or - 1/8 inch)	4-5-oz.	33,612
Salmon (red, king or silver) steaks, 7/8-inch thick (+ or - 1/8 inch)	4-5-oz.	8,952
Ocean perch fillets, skin on	8-12 fill. per lb.	93,684
Sea scallops, med. size	3-1 1/4 in. in diameter	21,792

Note: Requests for bids will be announced as they are issued. For additional information, contact the Marketing Division for Subsistence, Veterans Administration Supply Depot, P. O. Box 27, Hines, Ill. 60141.



Fish Spotting

BALLOONS TESTED FOR SPOTTING FISH SCHOOLS:

The use of balloons for spotting fish schools may turn out to be more effective than using other aircraft. Earlier this year the U. S. Bureau of Commercial Fisheries contracted with professional balloonists in testing the feasibility of using balloons to help spot schooling fish--tuna in this case--off the Pacific Coast, announced the Department of the Interior, March 6, 1965.

Instead of perching atop a 60-foot mast or "crow's nest," the tuna vessel lookout would scan a much larger area from a small gondola suspended from an inflated bag filled with hot air. According to navigational charts, the horizon is a little more than 10 statute miles from a man 60 feet above the surface. At 500 feet the horizon is nearly 30 miles away.

The balloon-testing experiments were conducted January 30-February 4, 1965, by the Bureau's Tuna Resources Laboratory, La Jolla, Calif., in cooperation with the Bureau's Oceanographic Instrumentation Office, Washington, D. C. The testing area was from 2 to 4 miles off La Jolla from a 110-foot converted wartime subchaser, the Yaqui Queen,

chartered by the Bureau and used as an albacore tuna troller.

The equipment used during the tests consisted of a spherical dacron balloon, 50 feet in diameter, with a tubular aluminum frame gondola capable of holding two persons. A ducted fan driven by a one-quarter horsepower electric motor mounted at the base of the balloon was used for inflation and maintenance of an internal pressure of about 2 pounds per square foot. The air was heated by a propane burner mounted in the base of the balloon and supplied by a hose to a deck-mounted pressurized propane tank. Extra pressure was supplied to the propane tank by a 50-pound CO₂ cylinder to force the liquified propane to a height of 500 feet. A hydraulic winch was used to handle the $\frac{5}{8}$ -inch nylon tethering line.

During the testing period, 4 inflations took place, with 6 ascensions of the balloon--4 manned and 2 unmanned. The balloon was flown in a variety of weather and sea conditions, ranging from dead calm to winds of 12 knots with moderate seas. During calm weather, 5 ascents were made to a maximum height of 500 feet. Total air time was about 8 hours. The four scientists cooperating in the project made ascensions and all were impressed with the exceptional stability of the balloon and by its vertical maneuverability. This was accomplished by burner adjustments made either at the gondola or the propane tank on the vessel. It was possible to make controlled "touch and go" landings on the water.

The experiments showed that all phases of the operations of a tethered hot-air balloon are capable of being safely performed from a vessel at sea, and are practical under a wide range of working conditions.

Two professional balloonists trained biologists from the Bureau's La Jolla Tuna Resources Laboratory in techniques of inflation, soaring, and recovery. The instructors say that sitting at 500 feet in a tethered balloon is safer than driving in modern traffic. The worst that could happen, they said, is that the hot air inside the big bag would cool and the balloon would descend slowly to the sea. The gondola is equipped to float and observers have life jackets. In normal operation the balloon is brought down by a cable attached to the winch on the vessel's deck.

A number of tuna vessels on the West Coast carried helicopters for use in spotting fish

schools during the past few years, but they have not been satisfactory. According to experienced vessel owners, the biggest problem has been the difficulty of maintaining the "choppers" at sea. Other vessels have tried small seaplanes, but they also have been mostly eliminated because recovering them in rough weather proved to be hazardous and difficult. Many tuna vessels on the West Coast now hire free-lance pilots, but small planes do not have the range for working far at sea.

According to a fishery biologist of the La Jolla Fishery-Oceanography Center, the next step in the balloon project is to design a balloon with aerodynamic qualities which can be towed by a tuna vessel without hindering its speed. Other fishery experts are looking forward to an even more sophisticated approach to sighting tuna. They are working on plans to equip the aerial platforms with television equipment completely controlled from the towing vessel.



Fish Sticks and Portions

U. S. PRODUCTION, OCTOBER-DECEMBER 1964:

United States production of fish sticks and fish portions amounted to 50.8 million pounds during the fourth quarter of 1964, according to preliminary data. Compared with the same quarter of 1963, this was an increase of 4.7 million pounds or 10.2 percent. Fish portions (30.8 million pounds) were up 5.4 million pounds or 21.0 percent, and fish sticks (19.9 million pounds) were down 658,000 pounds or 3.2 percent.

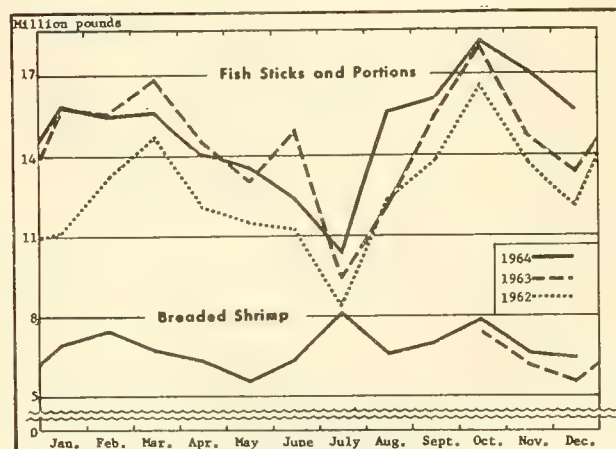


Fig. 1 - U.S. production, 1962-64.

Cooked fish sticks (18.7 million pounds) made up 93.5 percent of the October-December 1964 fish stick total. There were 30.1 million pounds of breaded fish portions produced, of which 24.5 million pounds were raw. Unbreaded fish portions amounted to 748,000 pounds.

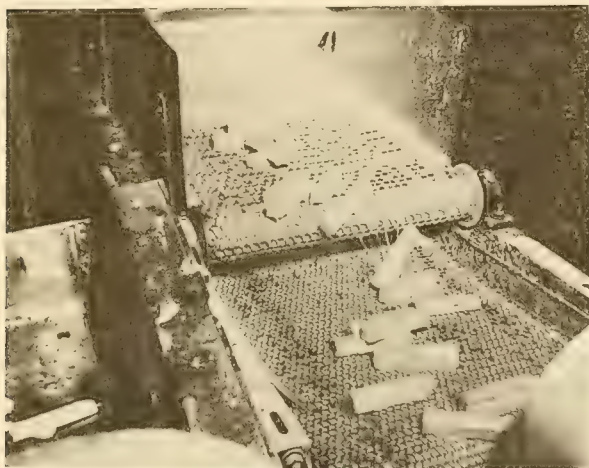


Fig. 2 - Fish sticks (pieces of frozen fish fillets frozen in blocks) passing through batter prior to being coated with breading in a New England frozen fishery products plant.

The Atlantic States remained the principal area in the production of both fish sticks and fish portions, with 16.3 and 18.6 million pounds, respectively. The Inland and Gulf States ranked second with 1.8 million pounds of fish sticks, and 11.6 million pounds of fish portions.

Table 1 - U.S. Production of Fish Sticks by Months and Type, October-December 1964 1/

Month	Cooked	Raw	Total
	(1,000 Lbs.)		
October	6,682	344	7,026
November	5,750	397	6,147
December	6,221	549	6,770
Total 4th Qtr. 1964 1/	18,653	1,290	19,943
Total 4th Qtr. 1963	18,755	1,846	20,601
Total 1964 1/	67,810	5,722	73,532
Total 1963	74,137	5,165	79,302

1/ Preliminary.

Table 2 - U.S. Production of Fish Sticks by Areas, October-December 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	16,347	22	16,843
Inland & Gulf States	6	1,817	7	1,976
Pacific Coast States	11	1,779	12	1,782
Total	40	19,943	41	20,601

1/ Preliminary.
2/ Revised.

Table 3 - U.S. Production of Fish Portions by Months and Type, October-December 1964 1/

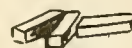
Month	Cooked	Breaded Raw	Total	Unbreaded	Total
	(1,000 Lbs.)				
October	2,033	8,739	10,772	293	11,065
November	1,742	8,921	10,663	201	10,864
December	1,810	6,818	8,628	254	8,882
Total 4th Qtr. 1964 1/	5,585	24,478	30,063	748	30,811
Total 4th Qtr. 1963	4,571	20,064	24,635	826	25,461
Total 1964 1/	20,898	82,134	103,032	2,541	105,573
Total 1963	16,623	74,967	91,590	3,054	94,644

1/ Preliminary.

Table 4 - U.S. Production of Fish Portions by Areas, October-December 1964 and 1963

Area	1/1964		2/1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . .	24	18,575	24	14,337
Inland & Gulf States . . .	8	11,586	10	10,310
Pacific Coast States . . .	10	560	10	814
Total	42	30,811	44	25,461

1/ Preliminary.
2/ Revised.



Great Lakes

1965 LAKE TROUT RESTOCKING PROGRAM IN LAKE MICHIGAN:

Upper Lake Michigan will be planted with 1.3 million yearling lake trout during summer 1965, probably in June, under the lake trout restoration program of the Great Lakes Fishery Commission.

With hatchery production exceeding Lake Superior's fish needs and sea lamprey control work moving ahead on schedule in Lake Michigan streams, the decision to plant the yearlings was made this March by the Lake Trout Rehabilitation Committee of the Great Lakes Fishery Commission at a meeting held in Milwaukee, Wis. The committee, representing U. S. state and Federal, and Canadian agencies in the Great Lakes area, made its decision after noting that chemical treatment should bring the sea lampreys under control in northern Lake Michigan by 1967.

Providing the planted fish with the needed leeway of safety until 1967 is the fact that lake trout are not usually attacked by sea lampreys until they are about 15 inches long. Thus, the 4- to 5-inch long fish scheduled for stocking this summer will not be in danger of predation before the Lake's sea lamprey popu-

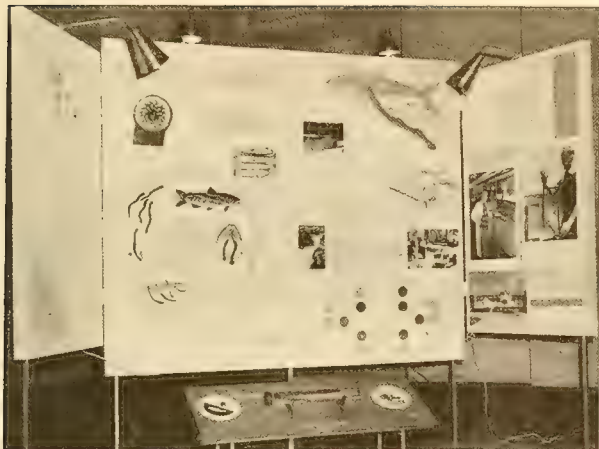


Exhibit showing sea lamprey research and control studies conducted for the Great Lakes Fishery Commission.

lations are substantially reduced two years from now.

Lake Michigan's planting stock will come from the Federal Jordan River Valley hatchery in northern Michigan. Plans call for releasing one million of the young fish at three separate locations between Seul Choix Point and Epoufette. Other releases will include 100,000 small lake trout in Grand Traverse Bay and 200,000 fish off Door Peninsula in Wisconsin waters. Those planting sites were singled out for the first round of stocking because they offer lake trout their best chances of survival.

Chemical control of sea lampreys is making its earliest gains in those areas, which historically have been good ones for supporting lake trout populations. Also of advantage is the fact that there is less small-mesh gill-netting in those areas than in some other parts of Lake Michigan.

All of the planted lake trout will be marked so that their growth, survival, natural reproduction, and movements can be checked by biologists. Releases of the fish will be made in deep-water areas and carefully timed with calm weather to prevent them from being swept ashore. Personnel of the Michigan Conservation Department will plant fish in reef and offshore areas from Seul Choix Point to Epoufette. (*News Bulletin*, Michigan Department of Conservation, Lansing, March 18, 1965.)



Gulf Fisheries Explorations and Gear Development

SHRIMP GEAR STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 57: To evaluate by comparative trawling, the ES-6(A) electric trawl was the objective of this cruise in the Gulf of Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. The cruise ended on March 8, 1965, with the vessel's return to Panama City.

Trawling tests during the cruise were conducted in depths of 20 to 30 fathoms on soft mud bottom east of Pass a Loutre, Miss. Methods used were similar to those of previous cruises--both nets were fished simultaneously, with identical scope ratio. To check both day and night fishing results, a minimum of 4 drags for each period were scheduled. Turbidity was checked by using a closed circuit TV camera with distance markers secured in front of the camera. The camera was lowered to various depths and the visible markers were counted on the TV monitor aboard the vessel. Winter storms persisted during most of the cruise and restricted operations.

Shrimp catches were light and ranged from 9 pounds to 6.5 pounds per hour during night drags with the nonelectric net. A total of 19 drags was completed, 11 of which yielded useful information. Results obtained from those 11 drags were: Day electric average 118 percent of the night nonelectric average; night electric average 83 percent of night nonelectric average; and day nonelectric average 110 percent of night nonelectric average.

Some typical indications of the turbidity in the area worked by the vessel were: Depth of water--5 fathoms: 2" definition at 4 fathoms; 0" definition at 5 fathoms. Depth of water--22 fathoms: 6" definition at 6 fathoms; 1" definition at 22 fathoms. Depth of water--30 fathoms: 2" definition at 8 fathoms; 1" definition at 30 fathoms.

Since the shrimp were not burrowing during the daylight hours, due apparently to the severe turbidity, the comparative effectiveness of the electrical gear could not be thoroughly evaluated.

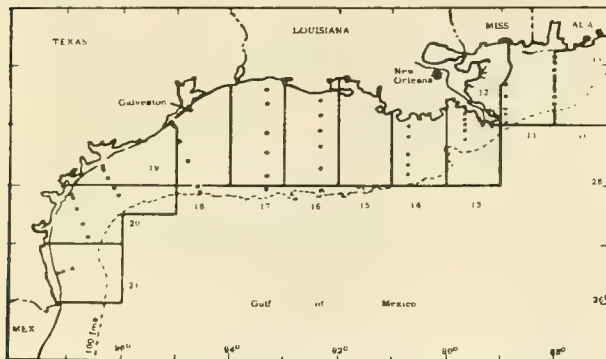
Note: See *Commercial Fisheries Review*, February 1965 p. 25.



Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-26 (January 14-February 28, 1965): A 15-day shrimp-staining experiment designed to study shrimp mortality and growth comprised a portion of this cruise by the chartered research vessel Gus III. The cruise was another of a series in a continuing Gulf of Mexico shrimp distribution study conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-26.

The shrimp-staining experiment took place on the Tortugas fishing grounds near Key West, Fla., between eastern and western Gulf shrimp sampling areas. A total of 11,549 pink shrimp was stained and released within that area.

Regular trawling operations related to the shrimp distribution study were carried out in 7 statistical areas which yielded fair catches of white shrimp and only relatively small catches of brown shrimp. A total of 23 standard 3-hour tows with a 45-foot flat trawl was made in conjunction with both east and west trawling operations of the cruise. There were 52 plankton tows made during the cruise, and 36 bathythermograph (BT) and 102 water (Nansen bottle) casts. In crossing the southeastern part of the Gulf en route to Key West, 264 drift bottles were released and 22 (270-meter or 886-foot) BT casts were made.

Most of the areas worked yielded varying amounts of white shrimp. The largest white shrimp catches were 33 pounds (21-25 count) from the 10-20 fathom depth in area 13, and 26 pounds (51-67 count) in area 20.

The best brown shrimp catch of the cruise was 36 pounds (31-40 count) from 10-20 fathoms in area 18. Catches of brown shrimp in other areas were not significant--mostly in area 20 where very small quantities of small and medium shrimp were caught.

Note: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

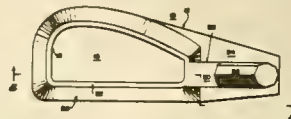
(2) See Commercial Fisheries Review, April 1965 p. 21.



Inventions

PATENTED LOW-COST MANUAL DEVICE FOR MOLDING FOOD PRODUCTS:

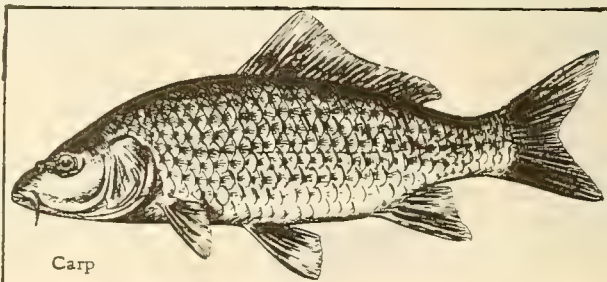
A patent was recently granted on a device for molding food products (including seafood) into patties of various shapes. The device is actually a simple mold (made of metal, wood, or plastic) which is operated by hand on a flat surface. The inventor emphasizes the novel designs that can be turned out at low cost with the device. (U. S. Patent No. 3,153,810 issued Jett E. Adams, 2318-B Jason Drive, Kirtland Air Force Base, New Mexico.)



Iowa

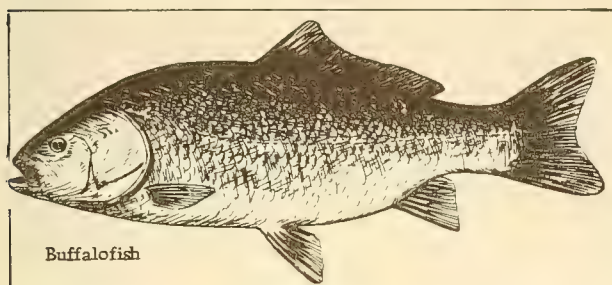
ROUGH FISH REMOVAL PROGRAM, 1964:

More than 900,000 pounds of rough fish were removed from Iowa waters in 1964 by Iowa State Conservation Commission rough fish removal crews and chemical control projects. The 13 fisheries stations in Iowa reported the removal of 588,900 pounds of carp; 175,800 pounds of buffalofish; 90,300 pounds of shad; and 47,000 pounds of other species, including sheepshead, dogfish, quillback, gar,



Carp

and suckers. About 160,000 pounds of carp, buffalofish, and sheepshead were sold on contract through the Spirit Lake Station. The remainder were either destroyed or carried away by the public.



The largest chemical control project conducted by the Iowa State Conservation Commission in 1964 was the renovation work on Lake Odessa in Louisa County. Over 500,000 pounds of rough fish were removed from that lake. (Iowa State Conservation Commission, February 8, 1965.)



Law of the Sea

INSTITUTE ESTABLISHED BY UNIVERSITY OF RHODE ISLAND:

The Law of the Sea Institute has been established by the University of Rhode Island to promote understanding and solution of the legal and international problems that can arise from attempts to exploit the ocean's resources, it was announced March 5, 1965.

"In many cases we appear to have at least the basic scientific and technological knowledge needed to mine the sea floors, undertake shellfish farming, or other projects, yet commercial interests are often discouraged because of the lack of clear-cut laws which would give them some protection for the heavy investments required," the Dean of the University of Rhode Island Graduate School of Oceanography said. "By means of this Institute we hope to bring together information on the law of the sea, provide for the exchange of ideas and information, assist in the education of students and the public, and publish papers and symposia proceedings," he explained.

In addition, the Institute is planning to conduct an annual week-long summer conference on the law of the sea to which scientific and legal experts would be invited, along with

students and others interested in the topic. The Institute, which is believed to be the first of its kind in the nation, will also sponsor a series of prominent speakers throughout the academic year.

One of the scientists who helped establish The Law of the Sea Institute said, "The Institute would bring together individuals and groups of diverse interests and points of view and thus provide new insights into law of the sea problems. By making information available to professionals and nonprofessionals in this country and abroad the Institute could contribute to the peaceful solution to some of the pressing problems of national rights in the oceans and seas of the world."

For instance, one of the most tangled questions is how far from shore do a nation's territorial boundaries extend. The United States claims 3 miles, while other countries maintain they control out to 6, 12, or even 200 miles. There are also unsettled questions of how you measure these boundaries, particularly where coastal or large groups of islands are involved. Quarrels have also broken out between nations over "historic fishing rights," which have evolved over many years.

Interest in territorial limits and mining rights has been heightened by rapid scientific advances and new engineering skills which may soon open up vast undersea mineral resources.

Today, in the words of one scientist, the "sea is getting smaller" and all these topics require continuing research and analysis "in the light of both changing technology and resource use and of changing national and international interests." (University of Rhode Island, March 5, 1965.)



Massachusetts

STATE LEGISLATURE PASSES RESOLUTION ON IMPORTS OF SOVIET COD BLOCKS:

In March 1965, the Massachusetts Legislature passed the following House resolution concerning United States imports of Soviet frozen cod blocks:

Whereas, The importation of Russian-caught codfish is a matter of deep concern to

Gloucester and to other New England fishing ports where an already high rate of unemployment exists; and

Whereas, The New England fishing industry is at a great disadvantage in competing with the Russian fishing fleet which is a completely subsidized government operation; and

Whereas, The Federal Bureau of Commercial Fisheries and the State Department have been asked to investigate the imports of Soviet cod blocks; therefore be it

Resolved, That the Massachusetts House of Representatives respectfully urges the Governor to instruct the Director of the Division of Marine Fisheries and the Commissioner of Commerce and Development to investigate the importing of Russian-caught codfish; and be it further

Resolved, That said director and said commissioner be further requested to cooperate fully with any Federal agency engaged in any similar investigation; and be it further

Resolved, That a copy of these resolutions be sent forthwith by the Secretary of the Commonwealth to His Excellency the Governor and to the Director of the Division of Marine Fisheries and the Commissioner of Commerce and Development.

* * * * *

MORE SANITARY METHODS FOR HANDLING FISH:

The use of forks for transferring fish from one receptacle to another, or from fishing vessel holds into unloading receptacles, will be prohibited in Massachusetts effective January 1, 1966. The announcement was made by the Division of Food and Drugs, Department of Health, Commonwealth of Massachusetts, in a letter dated March 16, 1965, to members of the fishing industry.

It was pointed out that forking has a detrimental effect on quality and that discontinuance of that method of handling fish is in the interest of the quality improvement program of fish received and marketed in Massachusetts.

The announcement urged the fishing industry to participate in the State's quality improvement program by cooperating with the Massachusetts Food and Drug Division, and

asked that the Division be kept informed on the progress made in developing a substitute method for handling and transferring fish whenever such transfer is required.

The Division also ordered that effective May 1, 1965, no fish shall be placed in containers or boxes which have not been previously cleaned and sterilized, and that all containers of fish in transit shall be covered and kept under proper refrigeration. The Massachusetts industry was advised that all containers of fish located outside of a fish processing plant, storage establishment, or vessel must be kept covered at all times to prevent contamination.



North Atlantic

FOREIGN FISHING ACTIVITIES OFF COAST, MARCH 1965:

Soviet fishing vessel activity in the North Atlantic during March 1965 was double that of the previous month. A total of 84 vessels were sighted and identified as 49 fish-factory stern trawlers, 19 refrigerated side trawlers, 13 refrigerated and processing fish transports, 1 fuel and water carrier, and 2 salvage tugs. This compared with 42 vessels observed in February and with only 3 vessels seen on Georges Bank at the same time a year earlier, although 15 Soviet factory stern trawlers and several fish transports were operating along the mid-Atlantic Coast areas during that period.



Fig. 1 - Soviet factory stern trawler (Tropik class) alongside fish transport vessel in North Atlantic.

Soviet fishing operations generally ranged from 70 miles south of Montauk Point, Long Island, eastward along the 100-fathom curve of the Continental Shelf 30 to 40 miles south and southeast of the Nantucket Lightship. Their activity was also confined to Nantucket Shoals adjacent to the lightship.

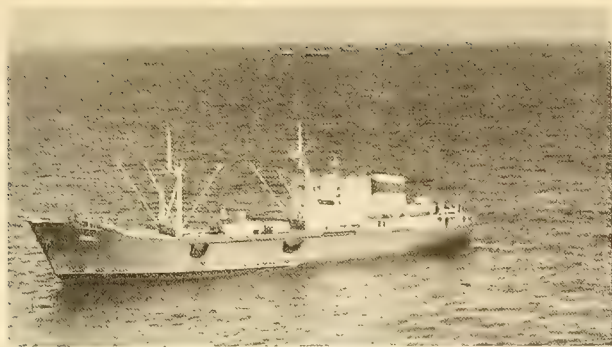


Fig. 2 - Refrigerated fish carrier Neva (Pervomank class) of 3,100 gross tons operating in North Atlantic.

Each of the vessels sighted was actively engaged in fishing operations and had large quantities of red hake and whiting on deck. Stern trawlers were seen hauling their trawls which were estimated to have between 30,000 and 40,000 pounds of fish. Dehydration plants were continually working, which would indicate that the excess portion of their catch was being used for fish meal. The apparent success in fishing for those species was demonstrated by the continuous increase of their fishing vessels and support ships.

During the month, the Soviet salvage tug Slavnyy towed the factory stern trawler Amet-ist into shelter of Cape Cod Bay in order to make repairs to the fishing vessel's propeller. The vessels were visited by the Bureau's Fisheries Management agents. The Soviet vessels had been vigorously exploiting the red hake fishery for several months prior to March. Although their operations had been observed during the weekly surveillance flights, there was some speculation concerning the quantity and use of their catch. While aboard the vessel, the Bureau officers learned that this particular stern trawler had been engaged in fishing operations for about one week. Their fish cargo was estimated to be more than one million pounds of predominantly red hake with smaller amounts of whiting. That would indicate a catch of more than 100,000 pounds of fish a day. It was learned that their catch per tow was about 30,000 pounds.

Both the red hake and whiting caught are processed and used for human consumption. The red hake are packed and frozen whole in cartons of about 40 pounds each. The whiting, however, are headed and gutted before freezing. Fish waste and catches in excess of their processing facilities are used for fish meal. The gear used is heavy, bottom-tending trawls with fine mesh in the cod end and extensions.

Only red hake and whiting were being caught during March, and the vessel crew indicated there was no interest in other species--at least not until the herring season starts on Georges Bank. Some lobsters were being caught for consumption aboard the vessel.



Fig. 3 - Deck view of Soviet trawler fishing early this year in North Atlantic (40° W. between 69° and 70° W.). Fish catch consists mostly of red hake and whiting (silver hake).

In order to observe foreign fishing activities in the North Atlantic, the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard.

Note: See Commercial Fisheries Review, April 1965 p. 25.



North Atlantic Fisheries Investigations

LATE WINTER DISTRIBUTION AND ABUNDANCE OF HERRING LARVAE STUDIED:

M/V "Phalarope" Research Cruise (March 9-12, 1965): To determine the late winter distribution and abundance of herring larvae was the purpose of this cruise by the chartered research vessel Phalarope, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Me. The area of operations was in the Sheepscot and Damariscotta estuaries and the Boothbay region off the coast of Maine.

BIOLOGICAL OBSERVATIONS: A total of 18 Boothbay Depressor trawl tows were made during this cruise at selected stations in the prescribed area. Except for one 15-minute bottom tow, all tows were oblique and lasted for one-half hour. In addition, at a single station off Tumbler Island, Boothbay Harbor,

an oblique 30-meter (98-foot) tow from 20 meters (66 feet) to the surface was made with a high speed Gulf III sampler, and Clarke-Bumpus closing nets were towed simultaneously at four levels--0, 6, 12, and 18 meters (or 20, 39, and 59 feet).

PRELIMINARY FINDINGS: Of the 683 herring larvae taken during the cruise, 414 were taken in one 15-minute bottom tow off Tumbler Island. The largest catches of herring larvae were made from the northern tip of Squirrel Island to Boothbay Harbor, and indicated a fairly heavy concentration of herring larvae.

Swarming barnacle larvae were the dominant zooplankters and constituted 97 percent of the zooplankton collected. Other zooplankters present were chaetognaths, the copepod *Calanus finmarchicus*, decapods, and harpacticoid copepods. Stomachs of 10 herring larvae ranging from 29 to 42 millimeters (1.1 to 1.7 inches) were examined for food content. Only one showed any evidence of intensive feeding on barnacle larvae. The remaining nine stomachs were fully compacted with small cyclopoid copepods.

Barnacle larvae began swarming in the Boothbay region during the first week in March 1963 and dominated the zooplankton until the third week of April. Surface water temperature during that period ranged from 37.5° F. to 43.0° F. The first large-scale barnacle swarming in 1964 occurred during the second week of March and continued to the second week of April. Surface water temperatures during the period ranged from 34.7° F. to 37.1° F. This year (1965), swarming first occurred in the Boothbay area during the second week of March. Surface water temperature was 37.5° F., suggesting that early spring surface temperatures of 34.7° F. influence the onset of barnacle swarming. Barnacle larvae were found throughout the water column. The greatest concentration was at 12 meters (39.4 feet), with decreasing numbers at 6 meters (19.7 feet) and the surface. Moderate numbers were found at the lower level of sampling at 18 meters (59 feet). With the colder temperatures found east of the Penobscot, past records indicate that swarming occurs later in that area than in the western region of the coast.

Note: See Commercial Fisheries Review, February 1965 p. 35.

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LARVAL HERRING DISTRIBUTION IN GULF OF MAINE STUDIED:

M/V "Rorqual" Cruise 1-65 (January 30-February 7, 1965): To determine the distribution of larval herring along the coast of the Gulf of Maine was the objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Rorqual. The area of operations was the coastal area between Cape Ann and Machias Bay within the 50-fathom line.

Herring larvae ranging in standard length from 20 to 42 millimeters (0.8 to 1.7 inches) occurred at 20 of the 21 stations covered on this cruise. The catch-per-tow ranged from 0 to 22 with the Gulf III and from 0 to 269 with the Boothbay Depressor No. 2 trawl. The total catch was 887 fish, with the largest catches in the western Gulf. No concentrations of fish were detected on the echo-sounder.

BIOLOGICAL OBSERVATIONS: Oblique hauls with the Boothbay Trawl 2 were made at 21 stations (from 20 meters or 66 feet to the surface at 15 stations, and from the bottom to surface at 6 stations). Oblique Gulf III tows were made from 20 meters to the surface at 12 coastal continuity stations.

HYDROGRAPHIC OBSERVATIONS: At each of the 12 continuity stations Nansen bottle casts, bathythermograph casts, photometer readings, and Secchi disc readings were made; 5 sea bed drifters and 5 surface drift bottles were also released.

Note: See Commercial Fisheries Review, February 1965 p. 35.

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EFFECTS OF TOW SPEED AND DISTANCE TRAWLED ON SIZE AND VARIABILITY OF CATCHES:

M/V "Albatross IV" Cruise 65-1--Part 1 (January 12-19, 1965) and Part 2 (January 19-25): To determine the effects of duration of tow, speed, and distance trawled on the size and variability of catches was the objective of this cruise in the southeast part of Georges Bank by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV. The cruise was in two parts because the vessel was forced to return to its base at Woods Hole, Mass., on January 16 to avoid a storm, and resumed the cruise on the 19th.

A total of 64 tows was completed during the cruise consisting of a series of 16 tows

each that lasted 15, 30, 60, and 120 minutes. At each station worked, the catch (or aliquot sample) of each fish species was weighed and measured. Quantitative samples of invertebrates were also obtained and 47 bathythermograph (BT) casts were taken while steaming, and taken about every 6 hours while on station. Stations were occupied according to a 3-stage sample design in order to obtain (along with duration of tow data) more information on efficiency of size of sampling unit currently used on survey cruises.

An odometer was attached to the foot rope of the trawl and number of turns recorded after each tow. At the first station a buoy with radar reflectors was anchored. Precise estimates of speed and distance trawled were obtained for 8 tows at station No. 1 by recording radar ranges and bearings of the buoy during each tow. Rough seas during the remainder of the cruise prevented further use of the buoy.

Blood samples were collected for further absorption studies on haddock blood, and yellowtail blood smears were taken for the School of Medicine of the University of Virginia. A visiting scientist from the Massachusetts Institute of Technology collected intestines from haddock and cod on Part I of the cruise. Those samples were to be analyzed for the bacillus, Clostridium botulinum, in the botulism investigation conducted by the Department of Food Science at M. I. T. The study is under a contract from the U. S. Bureau of Commercial Fisheries.



North Pacific Fisheries Explorations and Gear Development

HAKE POPULATION SURVEY CONTINUED:

M/V "John N. Cobb" Cruise 70 (February 1-March 12, 1965): Six weeks of hake explorations along the Pacific Coast were completed March 12, 1965, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. Purpose was to determine the late winter distribution and abundance of that species along the Pacific Coast and selected areas of Puget Sound.

Principal objective of the cruise was to locate and capture Pacific hake (Merluccius productus) off southern California during

their spawning period (as determined previously by hake egg and larvae surveys conducted by the Bureau's research vessel Black Douglas).

Secondary objectives were to: (1) make echo-sounding surveys to determine if hake are present in more northern areas along the coasts of Washington, Oregon, and northern California during late winter months; and (2) collect biological and oceanographic data.

ECHO SOUNDING TRANSECTS: Alternate offshore and inshore echo-sounding transects were made during transit to and from southern California and Mexico. Distances offshore ranged from 1 to 50 miles encompassing water depths from 20 to 1,300 fathoms. No significant signs of hake were noted except in the southern California area. Occasional traces of small dense schools of fish, believed to be anchovy, were seen at points along the entire coast at depths ranging from surface to 125 fathoms. The southern limit of operations was near Geronimo Island, Mexico, about 250 miles south of San Diego, Calif.

With the exception of one echo-sounding transect from south of San Diego, Calif., to Geronimo Island, Mexico, all fishing effort in southern California was conducted in areas adjacent to stations at which the Black Douglas had reported an abundance of hake eggs and larvae. Most drags were made on one school of hake near a California Cooperative Fisheries Investigations (CALCOFI) station located about 35 miles west of San Diego. Relocation of the school each morning by echo-sounding search patterns tended to show a north-northwest movement of the main body of hake at about 5 miles per day. (On one occasion the Black Douglas returned to the center of a spawning school of hake as defined by the John N. Cobb's echo-sounding pattern and collected abnormally large quantities of hake eggs. Some plankton net tows reported by the Black Douglas produced over 5 cubic centimeters of hake eggs.)

PELAGIC TRAWLING: A total of 31 drags was made using the "Cobb" pelagic trawl in the following areas: Puget Sound 2, Washington coast 1, Oregon coast 5, and southern California 23.

With the exception of two hake taken in one tow near Stonewall Bank off central Oregon and a small amount taken in Puget Sound,

Wash., catches of hake were made only in the southern California area. Thirteen of the drags off southern California produced catches of hake ranging from a few pounds to 20,000 pounds per 1-hour tow. Ten other drags off southern California produced only small amounts of squid, jellyfish, myctophids, pelagic shrimp, and anchovy.

In comparison with echo-soundings and catch rates of nonspawning hake made in prior years off Washington and Oregon, the echo-soundings near CALCOFI station would be classed as excellent and should have produced larger hake catches than were taken. Most large catches were made either in early morning before 9:00 or in late afternoon after 3:00, which suggests that fish may be able to avoid the net during mid-day periods.

Usual depth of the spawning school of hake was about 125 fathoms at surface-to-bottom depths of 500 to 800 fathoms. When hake were taken, catches consisted entirely of that species.

Two drags were made during the hours of darkness in the vicinity of spawning schools of hake. One of the tows (made at 115 fathoms) produced 200 pounds of hake while the other tow (made at a depth of 22 fathoms) produced only Euphausiids and jellyfish. Echo-soundings of schools of spawning hake in late evening and night hours failed to show a vertical migration towards the surface at approach of darkness as has been commonly observed on schools of nonspawning hake in more northerly waters.

Hake taken during drags through spawning schools usually ranged in length from 35 to 58 centimeters (13.8 to 22.8 inches) and consisted of from 80 to 97 percent males. One drag made on fish signs adjacent to the spawning school near the CALCOFI station and at a depth of 200 fathoms produced hake up to 63 centimeters (24.8 inches) in length and a higher percentage of females.

Severe gilling problems were encountered whenever large catches were made. That suggests that a smaller mesh size (less than 3 inches) should be used when fishing spawning schools of hake off southern California.

All female hake taken during the survey, including two fish taken in central Oregon, were either ripe, partially spent, or spent.

Stomach contents of fish were examined from each catch and were found empty.

GEAR USED: The principal gear used during the explorations was a Mark II "Cobb" pelagic trawl constructed of 3-inch webbing. A full-length cod end liner of $\frac{1}{2}$ -inch mesh was used during some drags to retain small specimens, but was removed during drags on schools of spawning hake off southern California. The "Cobb" pelagic trawl was rigged with two aluminum hydrofoil-type otter boards on 60-fathom bridles. Fishing depth of the net was determined with a dual electrical depth-telemetry system having a depth-sensing unit mounted at each otter board.

Other gear used during the explorations included: (1) a 1-meter plankton net, (2) a gravity-type bottom-core sampler, and (3) a reversing thermometer.

OTHER OBSERVATIONS: Twenty plankton tows with a 1-meter net were taken during the first 3 weeks of the cruise to determine if hake eggs and/or larvae were present. Tows lasted from 20 to 30 minutes and were made from near-surface waters to depths of 250 meters. Bottom depths over which the tows were made ranged from 30 to 1,000 fathoms and covered the area from Puget Sound, Wash., to San Diego, Calif.

Samples of bottom sediments were taken from the Columbia River to San Diego, Calif., with a gravity coring device for botulism studies being conducted by the Bureau's Seattle Technology Laboratory. A total of 21 samples was taken at predetermined stations at depths varying from 40 to 1,070 fathoms.

With the exception of a few days in the early part of the cruise, weather conditions were excellent. Wind velocities were mostly under 20 knots with many days ranging from calm to light airs.

M/V "John N. Cobb" Cruise 71: To continue the hake survey and other midwater trawl studies, the John N. Cobb was scheduled to depart Seattle, March 29, 1965, for 8 weeks of exploratory pelagic fishing from British Columbia to southern Oregon.

Waters to be investigated were Puget Sound, and the coastal area off Vancouver Island (British Columbia), Washington, and Oregon.

Major emphasis of Cruise 71 was to be on obtaining information relative to when and where hake (*Merluccius productus*) schools first appear off Washington, Oregon, and Vancouver Island in the spring. Secondary objectives will be to: (1) obtain additional data relative to catching efficiency of the "Cobb" pelagic trawl; and (2) obtain biological data on Pacific hake, such as degree of maturity, presence or absence of hake larvae and/or eggs in the surface waters, size, age and sex composition, and schooling behavior.

Note: See Commercial Fisheries Review, April 1965 p. 29, Feb. 1965 p. 36.



Oceanography

PRIVATE FIRM PLANS TO OPEN FISHING GEAR DEVELOPMENT BASE IN FLORIDA AND "SEA LAB" IN MARYLAND:

Fishing Gear Base in Florida: Plans to open a fishing gear development base in Sarasota, Fla., were announced in February 1965 by a large corporation (Westinghouse Electric Corp.).

An official of the firm said the new department is the first serious effort by a major de-

fense and space company to apply its technological skills to better equipping the U. S. commercial fishing fleet.

"Sea Lab" in Maryland: The same corporation announced plans on March 2, 1965, to build a multimillion dollar ocean engineering and research facility on the western shore of Chesapeake Bay near Annapolis, Md. The firm's representative said the 2-story structure on Chesapeake Bay would have 120,000 square feet of space and would house offices and laboratories for the company's underseas division.

The 115-acre site near the Chesapeake Bay Bridge will include a 30-acre lake and facilities for docking vessels up to 300 feet long. About 350 persons, including more than 200 scientists and engineers, will be employed at the plant, designed to accommodate a working force of 500. The lake will be dredged to a depth of 25 to 90 feet and used for testing underwater devices.

Work at the new "sea lab" will involve underwater weapons systems, mines, oceanography, underwater acoustic methods, and missile handling and launching procedures.



Artist's drawing of the "sea lab" complex to be built by a private firm on a 115-acre site near Annapolis, Md.

* * * * *

ANNUAL OCEAN SCIENCE AND OCEAN ENGINEERING CONFERENCE TO BE HELD:

The 1965 "Ocean Science and Ocean Engineering Conference and Exhibit" will be held at the new Washington Hilton Hotel, Washington, D. C., June 14-17, 1965. The conference is sponsored by The Marine Technology Society and The American Society of Limnology and Oceanography.

Some 80 papers will be given by scientists and engineers from universities, oceanographic institutions, private industries, and government agencies, announced the chairman of the Conference Program Committee. In making the announcement the chairman said, "The papers submitted indicate the breadth and depth of interest of our scientific and technical communities in the marine environment and in man's role of exploring and exploiting it for knowledge and resources. We believe the papers, together with the special symposia that will be offered, assure that the conference will serve to define and evaluate major new developments and future programs concerning the world ocean."

The papers to be presented fall under eight main headings: (1) measurement techniques and devices; (2) oceanographic data systems; (3) ocean engineering; (4) undersea vehicles; (5) marine resource exploration and exploitation; (6) general marine science; (7) results of U. S. Biological Program of Indian Ocean Expedition; and (8) distribution of Columbia River Water in the North Pacific.



Oregon

LARGE-SCALE HATCHERY SALMON PLANTINGS UNDER WAY:

The release of 330,000 yearling silver (coho) salmon in the Nehalem River system during early March 1965 heralded the annual spring planting of hatchery salmon and steelhead in Oregon rivers.

Over 40.8 million (over 1 million pounds) juvenile salmon and steelhead of all species, reared in the Oregon Fish Commission's 15 hatcheries to the size suitable for their downstream migration, are scheduled for release before the end of June 1965. They should supply returning runs of adult fish 2, 3, 4, and even 5 years from now. Hatchery rearing of juvenile salmon to the age they would

reach in nature before starting their seaward journey greatly reduces early mortality. In fact, Oregon salmon hatcheries report successful rearing to young fish of 85 percent of eggs collected. That is better than the natural survival rate.

This season an additional 3.7 million yearling salmon and steelhead were released prematurely from Oregon hatcheries as a result of the Christmas and late January floods. Another 24.4 million newly hatched salmon fingerlings were also to be released prematurely this spring from the surplus of eggs that were taken last fall as "insurance." Those fingerlings are now in excess of the rearing capacity of the Oregon Fish Commission hatcheries. (Oregon Fish Commission, March 12, 1965.)



Oysters

NEW SEED AREAS OPENED IN VIRGINIA:

The opening on March 8, 1965, of new seed oyster areas in the Piankatank and Great Wicomico Rivers marks a new era in the history of the Virginia oyster industry. Traditionally, the James River has supplied most of the seed oysters for Virginia private planters, but failure of spatfall has changed James River into an area of clean culling or tonging for marketable oysters.

About 70 acres of seed oyster grounds in each new seed-producing river were opened, according to the Repletion Officer, Virginia Commission of Fisheries. Each river was planted with shells by the Commission of Fisheries in both 1963 and 1964. As a result, seed oysters of several sizes (all small) were made available.

The head of oyster research at the Virginia Institute of Marine Science has monitored the shell plantings for spat collection after each spawning season. He reports that the spat count per bushel of shells is high in samples examined, although the shells were planted thickly, and it may be possible to dig into shells without spat. Policing by the Commission insures that such shells are culled back.

Planters and tongers, however, are faced with new decisions about where to tong and what to buy. According to the director of the

Virginia Institute of Marine Science, MSX is present in a large portion of the Piankatank seed area, although the Great Wicomico has been found almost free of MSX. He urges oystermen using the Piankatank seed to plant in very low salinity waters (such as Morattico and above in the Rappahannock River), or be prepared for serious losses of oysters by next summer. He added that Great Wicomico seed should be suitable for planting wherever oysters have thrived in recent years.

Research work done by the Institute indicates that the dry summers of 1963 and 1964 have permitted MSX to penetrate farther up the tributaries of Chesapeake Bay than ever before. Since the disease is permitted to spread by higher salinities, only a normally wet spring would enable oysters in moderate salinity areas to cast out MSX, the scientists said. They also report that rainfall experienced thus far has been inadequate to offset the encroachment of higher salinities throughout the Bay system because of drought conditions in 1963 and 1964. The scientists added that MSX does not affect the edibility of oysters although such oysters are seldom fat.



Potomac River Fisheries Commission

REGULATIONS FOR SOFT-SHELL CLAMS AND OTHER SPECIES:

Regulations of the Potomac River Fisheries Commission on the taking of soft shell clams in the Potomac River became effective February 16, 1965. (The Virginia Legislature and the Maryland General Assembly have passed laws giving the Commission authority over commercial clamming in the Potomac.)

The Potomac soft-shell clam regulations govern clamming with hydraulic or mechanical dredges and establish:

(1) A daily limit of 40 bushels of soft-shell clams for each licensed dredge or rig.

(2) A license fee of \$25.

(3) Prohibitions on clamming within 100 yards of "commercially productive" oyster-tonging areas; within 50 feet of any fish net, wharf, pier, or bulkhead; within 1,000 feet of any public bathing beach during the period from May through September; within 100 yards of the average low-water shoreline; within

500 yards of any occupied duck blind; and on Sunday or between sunset and sunrise on any other day.

The Potomac soft-shell clam regulations also govern the licensing of individuals and dredges, size of dredges, minimum size of clams, transfer of dredges, authority of enforcement officers, and penalties.

Acting under the Potomac River Compact of 1958 (between Maryland and Virginia), the Potomac River Fisheries Commission had previously issued commercial regulations governing the licensing and taking of finfish, crab, and oysters from the Potomac.

Note: Copies of the Potomac fishery regulations are available from the Potomac River Fisheries Commission, P.O. Box 128, Colonial Beach, Virginia 22443.



Puerto Rico

JAPANESE FROZEN TUNA SHIPMENTS TO PUERTO RICO CANNERIES, 1964:

Japan shipped a total of nearly 50,000 short tons of frozen tuna (including loins) to four United States tuna canneries in Puerto Rico during 1964. Albacore (round) accounted for some 28,000 tons, followed by yellowfin with about 16,000 tons (mostly gilled and gutted), skipjack (round) 4,000 tons, and a small quantity of big-eyed tuna. The remainder of about 1,400 tons was made up of albacore and yellowfin tuna loins. (Suisan Tsushin, March 4, 1965.)

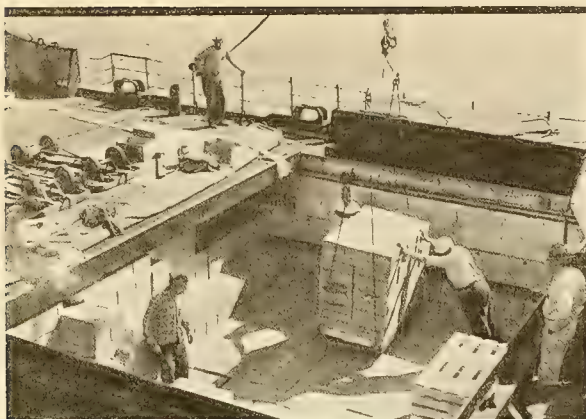


Salmon

U. S. PACIFIC COAST CANNED STOCKS, MARCH 1, 1965:

On March 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 1,966,187 standard cases (48 1-lb. cans), 511,774 cases less than on February 1, 1965, when stocks were 371,893 cases less than on January 1, 1965.

On the basis of a total of 2,342,254 actual cases (consisting of cans of $\frac{1}{4}$ -lb., $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon made up 51.3 percent (1,201,716 cases, mostly 1-lb. talls) of the total canners' stocks on February 1, 1965. Next came chum (536,529 cases, mostly 1-lb. talls), followed by red (411,505 cases). The remain-



A shipment of Alaska canned salmon being unloaded at a Port of Seattle Pier.

der of about 8.2 percent was coho (silver) and king salmon. A little more than 80 percent of the pink salmon stocks on hand was packed in 48 1-lb. cans, and the balance mostly in 48 $\frac{1}{2}$ -lb. cans.

Table 1 - Total Cannery Stocks of Pacific Canned Salmon, March 1, 1965

Species	Mar. 1, 1965	Feb. 1, 1965	Jan. 1, 1965
	(No. of Actual Cases)		
King	63,915	79,834	91,675
Red	411,505	511,299	607,913
Coho	128,589	146,885	176,504
Pink	1,201,716	1,550,541	1,795,619
Chum	536,529	648,041	726,063
Total	2,342,254	2,936,600	3,397,774

From February 1 to March 1, 1965, pink salmon stocks were lower by 348,825 actual cases (1-lb. talls lower by 273,519 cases), reds were down 99,794 cases, and chums were down 111,512 cases.

Carryover stocks at the cannery level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments at the cannery level from July 1, 1964, to March 1, 1965, totaled 4,016,622 actual cases (equal to 3,131,757 standard cases).

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 98 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Cannery Association, March 27, 1965.)

NEW FISH SCREEN DEVICE MAY HELP GUIDE MIGRANT FISH:

A new device with the name of "Velocity-Matching Traveling Fish Screen" is being used to protect young salmon in critical river areas. The screen moves in a downstream direction as fast as the current and guides migrant fish into a collection area.

The idea was conceived by a biologist of the Fish-Passage Research Program, U. S. Bureau of Commercial Fisheries, Seattle, Wash., who visited Mount Hood to examine the tramway taking skiers up the mountain to see if a similar design could be used for moving or protecting fish.

Table 2 - Total Cannery Stocks on Hand March 1, 1965 (Sold and Unsold), By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb.	5,286	87,050	39,405	6,115	1,201	139,057
48 $\frac{1}{2}$ -lb.	52,285	202,179	22,143	202,007	64,935	543,549
48 1-lb.	6,242	122,139	62,170	977,515	455,507	1,623,573
12 4-lb.	102	137	4,871	16,079	14,886	36,075
Total	63,915	411,505	128,589	1,201,716	536,529	2,342,254

Table 3 - Cannery Shipments from July 1, 1964 to March 1, 1965, By Species and Can Size

Case & Can Size	King	Red	Coho	Pink	Chum	Total
	(Actual Cases)					
48 $\frac{1}{4}$ -lb.	18,961	340,882	83,287	5,566	243	448,939
48 $\frac{1}{2}$ -lb.	84,557	484,915	32,232	401,461	93,156	1,096,321
48 1-lb.	15,879	375,915	106,339	1,420,409	423,100	2,341,642
12 4-lb.	314	4,813	16,619	83,318	24,656	129,720
Total	119,711	1,206,525	238,477	1,910,754	541,155	4,016,622

The Velocity-Matching Traveling Fish Screen has been used experimentally at Troy, Oreg., Carson, Wash., and Tracy, Calif., and appears very promising for future use. Large-scale testing of the screen is planned for the Snake River, but first many complicated engineering problems have to be worked out. The choice of location and preliminary testing will begin with low-water levels during the summer or fall of 1965. Prototype testing is scheduled for 1966.

The greatest problem encountered has been diverting fingerling fall chinook salmon from tons of debris. They are the smallest and weakest swimmers because they have had the least time in the river. The fingerling fish have to be picked out at the time of spring floods and fast water velocities. The debris in the water ranges in size from houses dislodged by floods to log rafts and dead animals. Under such conditions it is exceedingly difficult to try and pick out tiny salmon and steelhead from the debris without injuring them. There are many problems to be resolved and these are now all in the probing stage. The scientific studies in connection with the project are being conducted by the Bureau's Fish-Passage Research Program at Seattle.

Many years of research have been devoted to the problem of protecting young salmon and steelhead from destruction in rivers, streams, and canals, subject to hydroelectric or irrigation developments. This has included studies on the practicability of using such guiding devices as electricity, light, odors, sound, traveling cables, air bubbles, and louvers. "None of these, however, has been able to cope successfully with the high flow and debris of a major river in flood without excessive cost," said the Bureau's supervisory biologist in charge of the project. "In an attempt to eliminate the need for expensive structures capable of withstanding high flow velocities, this method of guiding fish was conceived. The velocity-matching aspect of the system would actually permit the guiding of fish in stream velocities greater than the maximum swimming speed of the fish."

The task of safeguarding the various species of Pacific salmon as well as steelhead has not been simplified because each year the complex of dams and irrigation projects becomes even more intricate. Only time will tell whether the Velocity-Matching Traveling Fish Screen will be the answer to guiding salmon and steelhead fingerlings at dam sites.

The device on an experimental basis so far appears to be very promising.

* * * * *

USE OF PIPES TO MOVE SALMON TO SPAWNING GROUNDS STUDIED:

Getting salmon upstream through pipes in order to help them reach their spawning grounds is becoming a reality. The pipes can be made of ordinary metal or of plastic, and may conceivably be used for salmon on part of their journey home to the Columbia and Snake Rivers to spawn.

Scientists of the Fish-Passage Research Program, U. S. Bureau of Commercial Fisheries, Seattle, Wash., have been working on a so-called "Pipes for Fish" project as part of the problem of safely passing adult fish en route to the spawning gravel. Up to now, research on the use of pipes is said to show great promise. Large 40-pound salmon have been successfully passed through pipes only one foot wide. But to provide a margin of safety, scientists are using pipes 2 and 3 feet wide in their studies. Pipe-like, darkened fish-passage channels are already in use in Washington, Oregon, and California.

How will the pipes be used as an aid in passing fish? "Pipes are potentially useful as transportation channels for migrating adult salmonids," say biologists of the Fish-Passage Research Program of the Bureau's Seattle Biological Laboratory. "Fish passage through difficult areas at dams might be less costly if pipe passageways were substituted for conventional concrete structures. Another potential application includes the use of pipes to extend fishway exits beyond the immediate influence of spillway gates," it was explained.

Pipes are not being proposed as a substitute for fish ladders. No prototype research has been done in the use of pipes for the vertical ascent of salmon at dam sites. But they may prove very valuable in moving fish from one point to another. At a dam site, for example, there may be several collecting points and only one fish ladder. So the salmon may conceivably be transported from one side of the dam to the fishway on the other side by means of pipes. (A very substantial savings in funds would result if only one fish ladder needed to be built instead of two.)

Fishway exits may be extended further upstream by the use of pipes. Biologists have noted and have been concerned over the fact that when the fish ladder exit is close to the spillway of the dam, a number of salmon wash back over the spill and have to reascend the long ladder. By extending the exit a greater distance away from the spillway, this fall-back problem could be alleviated.

Short lengths of pipes have been used to pass fish under small roads and highways. But with the advent of superhighways, the greater lengths of pipes that will be required, and the possibility of darkened passageways, a number of questions have arisen. Because of such developments scientists are seeking to expand their knowledge on the use of pipes.

The Bureau's Fish-Passage Research Program at Seattle has received inquiries from highway departments from Alaska to Maine requesting information on methods to pass fish in pipes under highway systems. Under certain circumstances pipes may be used to replace large transportation channels, thus considerably reducing construction costs by thousands of dollars.

Research on the use of pipes in passing salmon and steelhead has been accomplished in a two-year study at the Fisheries-Engineering Research Laboratory located on the Washington shore of Bonneville Dam. Sections of pipes up to 270 feet long were used, two 180-degree turns were tried, and pipes of 1, 2, and 3 feet in diameter were tested. Various water velocities, light conditions, and entrance conditions were tested to establish the preferences of salmon and steelhead in traveling through pipes. Hydrosopes, used for visual observations, were placed at the entrances and exits of the pipes. Electronic detectors were used to record fish behavior and passage within the pipe.

Exploratory tests indicated that salmon passage was usually more rapid when the pipes were partially filled with water instead of completely filled. Salmon prefer it that way, scientific tests have shown. Salmon also were reluctant to enter such a small passageway as a 12-inch pipe, and stayed outside the entrance for long periods of time. To make the small entrances more enticing for the salmon, scientists developed funnel-type entrances that finally led the fish into the narrow pipe opening. Once they entered the pipe, they quickly swam through it.

Shad

SUSQUEHANNA SHAD RESTORATION STUDY ENCOURAGING:

It may be possible to restore the once great shad runs of the Susquehanna River. Shad have been barred from the Susquehanna for more than 50 years by dams and pollution. But now a study has shown that shad can spawn in the upper Susquehanna and successfully migrate to sea. The next objective of the study is to find out if adult shad will migrate upstream through the still waters behind dams.



The study on shad restoration in the Susquehanna was launched after the Pennsylvania Fish Commission in 1962 asked the U. S. Interior Department to request that the Federal Power Commission require fishways around four dams on the lower Susquehanna. Since the fishways could cost as much as \$10 million, a comprehensive study was planned to determine if the river would support restored runs of American shad.

The Susquehanna shad study is a cooperative endeavor by fishery agencies of New York, Pennsylvania, and Maryland, four electric power companies that have dams along the river, and the U. S. Fish and Wildlife Service.

The results so far have been gratifying. In June 1964, about 16 million shad eggs from the Columbia River in the Pacific Northwest were flown to the Susquehanna. Biologists placed the eggs in hatching boxes in the Susquehanna within 24 hours after they had been taken from the Columbia. An additional 3.5 million shad eggs were taken from the Susquehanna Flats area of Chesapeake Bay for use in the study.

Many of the young fish that hatched from those transplanted eggs have now successfully migrated to sea past four dams on the Susquehanna. The growth rate for those yearling shad averaged nearly 1 inch per month.

Shad eggs from the Columbia and from the Susquehanna Flats were also used in bio-assay studies of water from the Susquehanna River. The bio-assays have helped substantiate field observations that waters of the Susquehanna River, except possibly one area polluted by mine drainage, are suitable for hatching of shad eggs and the rearing of young shad. Shad hatched in the upper waters of the river in the spring of 1964 were able to move down through the polluted area with little if any noticeable effect on the fish.

The study will now focus on whether adult shad will migrate upstream through the still waters behind dams. To do this, a fish-trapping facility is to be built at Conowingo Dam near the mouth of the Susquehanna River. The trap, which will catch adult shad for transplanting upstream, will be in operation when the shad runs come up from Chesapeake Bay in the spring of 1965.

Adult shad trapped at Conowingo will be tagged and released in the forebay above Conowingo Dam and near Harrisburg, Pa. Two types of tags will be used--regular numbered tags and a newer type that includes a sonar device. The sonar tags give off signals that can be picked up by biologists using hydrophones. Eavesdropping on the fish will indicate how well they orient themselves to continue the upstream migration. Sportsmen will be asked to help supply information with tags which they recover.

Other research activities to be continued in the spring of 1965 include further hatching box and bio-assay studies to define the tolerance of shad eggs and young to polluted water, and water chemistry analysis of the river in areas that are polluted by acid drainage from coal mines.

Note: See Commercial Fisheries Review, May 1963 p. 41, Aug. 1963 p. 48.



Shellfish

SEED CULTURE PROGRAMS CONDUCTED BY ATLANTIC COASTAL STATES:

Comparing techniques for artificially propagating oysters and clams was the main objective of the first Shellfish Seed Culture Conference held at New York State University, Stony Brook, N. Y., earlier this year. The head scientist of oyster research at the Vir-

ginia Institute of Marine Science, Gloucester Point, Va., presented available information on the Institute's successful efforts in artificially breeding and culturing oysters. A program of oyster breeding at that Institute is being conducted to obtain MSX-resistant brood stock. Hatchery and pond culture have been necessary in northern states because natural setting is inadequate.

It was disclosed during the Conference meetings that 5 Federal or state agencies and 9 private groups or companies, ranging in location from Cape Cod to Florida, have started hatchery or pond-culture programs to breed shellfish. Informal reports and discussions by oyster farmers and biologists revealed that nursery areas for newly-set spat are the most pressing problem.

The Institute scientist said, "We are moving ahead very well in our program to provide MSX-resistant brood oysters. When we have suitable brood stock, oystermen must be prepared to breed in hatcheries or secluded ponds away from the natural spatfall. With present facilities the Institute can only provide brood stock, and it cannot attempt to breed resistant oysters in quantities. Therefore, oystermen must be thinking ahead about their own controlled breeding sanctuaries." He reported that Virginia oystermen are interested in pilot hatcheries, and indicated that the Institute is encouraging such efforts to provide experience. The ultimate step in repopulating MSX-infested waters in Virginia depends upon breeding commercial quantities of resistant oysters in hatcheries, ponds and natural bodies of water with restricted flow to retain larvae.

Commercial hatcheries are not feasible in Virginia at existing prices of oysters, the Institute scientist believed, although improved techniques learned through pilot operations may reduce production costs considerably. In the Long Island area, prices of \$15 or more per bushel encourage controlled culture methods. Long Island oysters are sold as raw oysters on the half-shell at fancy hotels and restaurants, whereas Chesapeake Bay oysters are generally sold freshly shucked for nationwide distribution and home eating.

The conference at Stony Brook was attended by 60 persons representing every coastal state from Virginia to Maine. The conference was jointly sponsored by the Oyster Institute of North America, the Bureau of Marine Fisher-

ies of the New York Conservation Department, and the Biology Department of New York State University. (Virginia Institute of Marine Science, Gloucester Point, March 4, 1965.)



Shrimp

BREADED PRODUCTION, 1964:

United States production of breaded shrimp during 1964 amounted to about 90.7 million pounds--an increase of 19 percent as compared with 1963.

The Gulf States ranked first in the production of breaded shrimp in 1964 with 55.0 mil-

Table 1-U.S. Production of Breaded Shrimp by Months, 1963-64

Month	1/1964	1963
	. . (1,000 Lbs.). .	
January	7,347	2/
February	8,045	2/
March	7,249	2/
April	7,027	2/
May	6,171	2/
June	6,588	2/
July	8,641	2/
August	7,299	2/
September	7,830	2/
October	9,169	7,390
November	7,852	6,129
December	7,460	5,513
Total	90,678	76,216
1/Preliminary. 2/Not available.		

Table 2-U.S. Production of Breaded Shrimp by Areas, 1963-64

Area	1/1964			1963		
	Plants	Quantity	Value	Plants	Quantity	Value
	No.	1,000 Lbs.	\$1,000	No.	1,000 Lbs.	\$1,000
Atlantic	19	28,449	19,263	24	23,545	15,752
Gulf	23	54,942	38,683	27	47,054	33,551
Pacific	8	7,287	5,095	10	5,617	4,224
Total	50	90,678	63,041	61	76,216	53,527
1/Preliminary.						

Table 3 - U. S. Production of Breaded Shrimp, 1954-64

Year	Quantity	Value
	1,000 Lbs.	\$1,000
1/1964	90,678	63,041
1963	76,216	53,527
1962	76,803	62,230
1961	73,795	55,089
1960	70,348	47,015
1959	69,764	45,314
1958	60,865	43,622
1957	51,085	37,764
1956	50,888	37,301
1955	38,991	26,907
1954	24,802	17,579
1/Preliminary.		

lion pounds, followed by the Atlantic States with 28.4 million pounds, and the Pacific States with 7.3 million pounds.

* * * * *

BREADED PRODUCTION, OCTOBER-DECEMBER 1964:

United States production of breaded shrimp amounted to about 21.1 million pounds during the fourth quarter of 1964, according to preliminary data.

The Atlantic and Gulf States ranked first in the production of breaded shrimp with 19.5 million pounds.

Table 1 - U. S. Production of Breaded Shrimp by Months, October-December 1964

Month	Total 1,000 Lbs.
October	7,950
November	6,662
December	6,442
Total 4th Qtr. 1964 1/	21,054
Total 4th Qtr. 1963	19,032
1/Preliminary.	

Table 2 - U. S. Production of Breaded Shrimp by Areas, October-December 1964

Area	1964		1963	
	No. of Plants	1,000 Lbs.	No. of Plants	1,000 Lbs.
Atlantic and Gulf States ..	34	19,503	35	17,556
Pacific States ..	8	1,551	8	1,476
Total	42	21,054	43	19,032

* * * * *

REVISED RULES AND SPECIFICATIONS ON FUTURES TRADING IN FROZEN SHRIMP:

New rules and specifications applicable to futures trading in frozen shrimp for delivery in October, December 1965, February and April 1966, were issued in March 1965, by the Chicago Mercantile Exchange, Chicago, Ill. The rules apply specifically to raw, frozen, headless shrimp which have been caught and processed in the Western Hemisphere--brown, white, or pink in color.

Trading under the new rules and specifications opened April 1, 1965, on the Chicago Mercantile Exchange, at which time buyers and sellers negotiated contracts for delivery in October 1965.

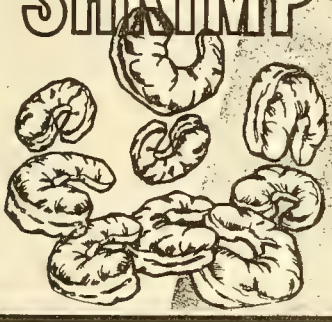
The new rules and specifications as published follow:

**FUTURES
TRADING IN**

FROZEN

(BROWN, PINK AND WHITE)

SHRIMP



CHICAGO MERCANTILE EXCHANGE
110 N. FRANKLIN STREET • CHICAGO, ILLINOIS 60606

The rules in this chapter shall apply specifically to raw, frozen, headless shrimp, brown, white or pink color. Method of trading, clearing, settlement and delivery of contracts as well as any other matters not specifically covered by this chapter shall be governed by the rules of the Exchange.

CLASSIFICATION AND GRADE—All futures contracts for Frozen Shrimp shall be U.S. Grade A raw, frozen, headless shrimp with a count of 15/20 to the pound, which have been caught and processed in the Western Hemisphere. All shrimp must meet the requirements of standards as promulgated by the United States Department of Interior, Fish and Wildlife Service.

FUTURES CALL—Futures contracts shall be scheduled for trading and for delivery in such months as may be determined by the Board of Governors.

TRADING UNIT ON FUTURES CALL—All transactions cleared through the Clearing House shall be in units of 5,000 pounds.

PRICE FLUCTUATIONS ON FUTURES CALL—Minimum price fluctuations on the futures call shall be 1/10 cents per pound.

DELIVERIES AND SUBSTITUTIONS ON THE FUTURES CALL—To qualify for delivery Frozen Shrimp shall be tendered for delivery in accordance with requirements of the Exchange rules and with specifications announced by the Board of Governors prior to the opening of the contract. The weight of a delivery unit shall be 5,000 pounds and the grade thereof shall comply with the contract of sale subject to such substitutions as are allowed.

A delivery unit of 5,000 pounds shall consist of 100 master cartons, each master carton containing ten 5-pound packages. The unit shall consist of not more than 3 lots or sub-lots with no lot or sub-lot weighing less than 1,000 pounds. The entire unit must be processed by one packer and must be stored during any one calendar month. Each delivery unit must be uniform as to color.

Frozen Shrimp which have been in storage more than eight months are not deliverable except that a delivery unit delivered in accordance with the rules during a delivery month is eligible for re-delivery through that month.

Allowable variations in quantity of a delivery unit are as follows: Minimum delivery unit: 4,750 pounds—95 master cartons of 50 pounds each. Maximum delivery unit: 5,250 pounds—105 master cartons of 50 pounds each. A weight tolerance of 3% shall be permitted. Payment shall be made on the basis of the exact quantity delivered.

All shrimp delivered on Exchange contracts shall be of good pack, glazed and packed in paperboard cartons which must meet all Federal regulations governing labeling and packing.

All shrimp shall conform in every respect to the provision of the Federal Food, Drug and Cosmetic Act together with all regulations promulgated thereunder.

Inspection certificates must be in good standing up to 5:00 P. M. on the business day following day of tender.

Per delivery shall be frozen shrimp in approved warehouses in Chicago. Delivery in approved warehouses west of the eastern borders of the states of Montana, Wyoming, Colorado and New Mexico may be made at 3¢ per pound allowance. Delivery may be made in approved warehouses outside of Chicago and east of the eastern borders of Montana, Wyoming, Colorado and New Mexico at an allowance of 2¢ a lb.

Permissible substitutions shall be:

- (1) Frozen shrimp with a count of less than 15 to the pound and meeting all other requirements of these rules shall be deliverable at par.
- (2) Frozen shrimp with a count of 21/25 to the pound and meeting all other requirements of these rules shall be deliverable at 8¢ a pound allowance.

- (3) *Grade B shrimp meeting all other requirements of these rules and grading 85 to 89 points shall be deliverable with an allowance of 1¢ a pound. Grade B shrimp grading 80 to 84 points shall be deliverable with an allowance of 3¢ a pound.*

Each delivery unit must be uniform as to count per pound.

INSPECTION CERTIFICATES—Inspections will be made for members only and in the order of applications filed except precedence shall be given to inspections relating to transactions made on Exchange.

An official inspection certificate shall be final. No re-inspection upon the same application shall be permitted.

No member shall order an official inspection on another member's goods without the written order of such member.

An official inspection certificate on Frozen Shrimp issued by the Exchange shall state the location and the grade established. It shall bear the signature of the President or Assistant to the President and the seal of the Exchange. It shall state the date of inspection and the time when the certificate expires. This certificate shall be based upon an inspection certificate of the United States government and such government certificate (or a copy thereof) shall in all cases accompany the Exchange certificate.

The removal of the commodity from the place or location designated on the inspection certificate invalidates the certificate.

The charge for inspection shall be the cost plus 50¢ per lot for Exchange certificate.

LIFE OF INSPECTION CERTIFICATE—An Exchange inspection certificate for quality or weights of frozen shrimp in cold storage shall expire on the first business day of the sixth month following date of inspection provided the shrimp have remained in the same warehouse and have been kept under proper refrigeration in the meantime.

STORAGE CHARGES ON FUTURES CALL TO BE ON A PRO RATA BASIS—On all deliveries made on the futures call the seller must assume storage up to 5:00 P. M. on the second business day after the date of delivery. The proration shall be on the basis of 1/30th of the prevailing monthly storage rate at the particular warehouse raised to the nearest 5¢ and multiplied by the number of days remaining to the next storage expiration date (all months figured on the basis of 30 days). In no case shall handling charges be included in such proration. The storage charges shall be paid in advance by the person holding shrimp on the storage expiration date and pro rata charges prepaid by such holder shall be added to and shown on the tender notice.

SPECULATIVE POSITION LIMITS—No member for himself or for a customer, and no firm for its own account or for the account of a customer, may carry, control, or have a proprietary interest in more than a total of 200 frozen shrimp contracts, with a maximum of 200 in any one contract month, nor shall any individual, customer, or firm exceed the above limits in any single day's trading.

Note: See *Commercial Fisheries Review*, April 1964 p. 30, December 1963 p. 42.



South Atlantic Fisheries Explorations and Gear Development

ELECTRIC SHRIMP TRAWL STUDIES:

M/V "Oregon" Cruise 98 (February 1965):

To test and evaluate an electric shrimp trawl on the royal-red shrimp grounds off St. Augustine, Fla., was one objective of this two-phase cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. Another objective, carried out during the second phase of the cruise, was to

obtain photographic data on the royal-red shrimp grounds.

Five days were spent testing and evaluating the electric shrimp trawl on the royal-red shrimp grounds off St. Augustine, during phase I completed February 13, 1965. The trawl was equipped with a specially designed, battery powered, deep-water pulse generator capable of withstanding pressures in the 200-fathom depth range.

It was not possible to follow the normal procedure of dragging both an electric and a nonelectric trawl simultaneously because of physical and mechanical conditions. Therefore, consecutive drags duplicated as closely as possible, were made. A total of 23 drags



Housing of underwater movie camera attached to its frame in the mouth of a shrimp trawl. Used by the M/V Oregon for motion picture photography of both trawl performance and shrimp reaction behavior.

was completed during that trial. The electrical components functioned normally, and the gear did not present any handling problems. The results from the relatively small number of drags were generally inconclusive, although the largest individual catch of 94 pounds (for a 2-hour drag) was made in the electric net. The total catches from both types of trawls were nearly identical. One noteworthy preliminary result was that whereas the catches of the nonelectric trawl were equally divided by weight between shrimp and fish, the catches of the electric trawl had half the weight of fish. From the results obtained during this cruise, procedures were developed which will allow a continuing program to fully evaluate the effectiveness of the electric gear in this fishery.

Twelve days were spent in the second phase of the cruise (completed February 25, 1965) with the objective of obtaining photographic data on the royal-red shrimp grounds. Due to extreme surface weather conditions and the strong current of the Gulf Stream (estimated at 4 knots), the CA-8 still camera sled was unable to reach bottom. Because of the high current speed during the period, the shrimp trawls were not reaching their maximum configuration. This caused the movie camera system to become improperly positioned to record the bottom.

A total of 47 drags was made with a 40-foot flat trawl in depths ranging from 150 to 300 fathoms. The best depth was found to be 220-225 fathoms and 42 of the 47 tows made

were completed there. Shrimp catches were light, with a total of 676 pounds of royal-red caught for the entire cruise. The predominant species of trash fish were hake (Merluccius albidus), cod (Gadidae), sea robin (Peristedion sp.), rat-tail (Macrouridae), and crab (Cancer sp. and Geryon sp.).

Severe weather conditions caused two temporary halts to the operations in the Gulf Stream. That time was spent dragging in the 30- to 40-fathom depth range off Cape Kennedy and Bethel Shoals for brown shrimp (Penaeus aztecus). Some 12 commercial shrimp vessels were working those grounds, which had been first located during a previous Oregon cruise. Exploration during 19 drags showed that trawlable bottom extended at least several miles south of the area previously delineated.

Note: See Commercial Fisheries Review, April 1965 p. 36, March 1965 p. 49.



South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1965:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for January-March 1965, follows:

Shrimp Studies: Regular station trawling throughout coastal waters during January-March 1965 showed the presence of a fairly good wintering-over population of white shrimp. This was not the case during the same periods in 1963 and 1964, both of which were poor years for white shrimp. Milder water temperatures throughout the State during the past quarter may be responsible for the increased abundance of white shrimp this year.

The average catch per unit of effort for white shrimp in experimental trawling was about 15 times as great during January-March 1965 as it was for the same period in 1964, and about 5 times that of the same period in 1963 (table). While not as plentiful as in January-March 1962, white shrimp during the present quarter are sufficiently abundant to produce a fair crop of "roe" shrimp this spring, if conditions remain favorable.

The numbers of spot in coastal waters increased considerably during this quarter as compared with that period of 1964,

whereas croaker declined in abundance for the two periods (table). Blue crabs, both mature and immature, increased significantly in experimental trawling during the January-March quarter this year. The general increase in the abundance of most commercial species during this quarter as compared with that of 1964 as mentioned in the case of white shrimp, may be due to mild water temperatures experienced this winter.

North Carolina Average Catch Per Unit of Effort for Various Species at Regular Shrimp Survey Stations, January-March, 1962-65

Year	Spot	Croaker	White Shrimp	Blue Crabs	
				Mature	Immature
1965	7.2	5.7	15.7	6.2	12.0
1964	0.7	9.5	0.1	3.2	9.4
1963	7.9	10.2	3.2	8.1	8.6
1962	22.1	18.6	26.3	14.1	23.9

Experimental plankton tows throughout coastal waters during January-March 1965 indicated that brown shrimp postlarvae were over two times as abundant as during the same period of 1964. Those postlarvae began to enter coastal sounds and inlets in significant numbers by February 8, and continued to recruit in abundance through February 28, at which time their numbers began to decline. The recruitment of brown shrimp postlarvae was about one month earlier this year than last, and this is quite possibly a result of warmer water temperatures during the past fall and winter.

The abundance of postlarval brown shrimp during the first quarter of the year for the past five years shows a distinct relationship between these numbers and the commercial catch in June, July, and early August. If this same pattern continues in 1965, then the catch of brown shrimp in those months should be slightly above average. This, of course, is provided no excessive mortalities of young shrimp occur in the nursery areas up to June, as was the case in 1960 when a cold snap in March apparently caused considerable mortality of postlarvae. Although no cold snaps have occurred which have caused sudden lowering of water temperatures to date, excessive rainfall in February and March may possibly have considerable effect on the young shrimp. The outlook is at this time, nonetheless, considerably better than in 1964, and if a second postlarval peak occurs in early April as has been the case in most years, it will be improved even more.

Pond Cultivation: Experimental shrimp ponds at Bears Bluff Laboratories were drained, repaired, and refilled during this quarter.

Stocking with postlarval brown shrimp has begun and will continue through April.

Several small-scale pond cultivation experiments were carried out in a temperature-controlled 3,000-gallon concrete tank during this quarter. The tank was stocked with postlarval shrimp less than $\frac{1}{2}$ inch in total length in late February, and by mid-March the young shrimp were already over one inch long. The water in the tank was kept at 70°-75° F. and the shrimp were fed heavily on chopped fish and green algae.

In another small-scale experiment using a heated (70°-75° F.) concrete tank, juvenile channel bass were stocked on January 6, 1965. These fish ranged in total length from 2 $\frac{1}{2}$ -5 inches, averaging 3 $\frac{1}{2}$ -4 inches, when stocked. Under natural conditions, young channel bass grow very little if at all during cold weather, but in the heated tank with heavy feeding of shrimp, they showed considerable growth. By March 18 the fish ranged from 3 $\frac{1}{2}$ to 7 $\frac{1}{2}$ inches in total length, averaging about 6 inches. This rate of growth is probably comparable to that under natural conditions during the summer months.

Note: See Commercial Fisheries Review, Mar. 1965 p. 51.



States Legislation

ACTIONS AFFECTING FISHERIES:

Following is a supplemental list of proposed State Legislative actions affecting fisheries. The bills listed are those introduced during the current session of the various State Legislatures. (Information Letter, National Canners Association, March 20, 1965.)

Alaska: SCR 11 relates to fisheries research projects in the northwest portion of the States.

S. 112 relates to the stabilization, maintenance, quality control, and development of the shellfish industry of the State; would create an Alaska Shellfish Marketing and Quality Control Advisory Board. It also would provide for an assessment on shellfish processors in the State to finance the Act.

S. J. R. 48 requests full support through appropriations for the Commercial Fisheries Research and Development Act of 1964.

S. J. R. 46 calls for a national department of Fisheries.

Maine: H. 849 relates to the use of sardine tax revenues for advertising.

H. 938 would place a tax on lobsters shipped beyond the State.

Maryland: S. 464 would change laws on issuing and suspending licenses of canneries and frozen food processing plants.

H. 1116 would exclude canned and sterilized shellfish from State limitations on the importation of shellfish.

H. 1108 would give the State Health Department jurisdiction over equipment used in making or preparing food including cannery equipment.

H. 1159 defines the sanitation of equipment in connection with making and preparing food, including cannery equipment.

Note: See Commercial Fisheries Review, April 1965 p. 37.



Transportation

SPECIAL "VANSHIPS" AND "TRAILERSHIPS" FACILITATE HANDLING OF FISH AND OTHER CARGO IN STEAMSHIP TRADE BETWEEN ALASKA AND WASHINGTON STATE:

The "vanships" Nadina and Tonsina, coastal freighters of a west coast steamship company, are making regular trips between Seattle, Wash., and the railhead port of Whittier in central Alaska. The vessels carry much of their cargo in special vans on deck. The vans are held firmly in place by a framework of steel posts with fixed metal heads resembling "lollipops." Loading and unloading is done by a dock crane. The vans are 24 feet long, 8 feet wide, and 8 feet high. One van makes a load for a truck trailer; a railway flatcar will hold two. Some of the vans have temperature-control facilities, which can be plugged into the ship's electrical system to maintain perishable freight at regulated temperatures. The Nadina and the Tonsina can each carry 175 vans, in addition to automobiles and other freight. (The Seattle Times, January 31, 1965.)



The vanship vessel Nadina being loaded at Seattle, Wash., with special vans for shipment to Whittier, Alaska.

Another shipping company is operating the "trailerships" Seattle and Anchorage directly between Seattle, Wash., and the Alaska ports of Anchorage and Kodiak. Each of the trailerships is capable of carrying 166 35-foot truck trailers and also has 425,000 cubic feet of space for break bulk cargo. The Seattle and the Anchorage each carry an electric crane to load and discharge the trailers. The trailers are 35 feet long, 8 feet wide, and 8½ feet high. Some of the trailers have temperature-control facilities. These units operate on either electric current or liquid propane gas. The trailers are designed for land hauling by any highway tractor having a minimum pin-to-cab clearance of 64 inches. They can also be hauled by rail.

Strengthened for navigation in ice, the Seattle and the Anchorage are providing year-round service to the port of Anchorage and central Alaska. They are reported to be the first deep-draft commercial freighters to navigate ice-bound Cook Inlet in winter. (Anchorage Daily Times, December 17, 1964, and other sources.)

The vanships and the trailerships with their containerized freight can be loaded and unloaded much faster than ordinary freighters. This cuts terminal handling charges which are an important part of ocean shipping costs.

Frozen halibut, salmon, sablefish, king crab meat and sections, and other fishery products are some of the products shipped from Alaska in the vans and trailers.



Tuna

BEHAVIOR STUDIES AID UNITED STATES FISHING INDUSTRY:

Research on the behavior of tuna, whether in the open sea or in captivity, is conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Kewalo Basin, Honolulu, Hawaii, and at the Tuna Resources Laboratory in La Jolla, Calif. The purpose is to find out what tuna can see, hear, and smell, what bait will entice them, and what net or line will best catch and hold them. In this way, scientists hope to learn how to predict tuna response to both natural and artificial stimuli in the ocean. Information from the results of the research will be passed on to the United States tuna fishing industry.



Fig. 1 - Skipjack tuna swimming in shoreside tank at the U. S. Bureau of Commercial Fisheries Kewalo Basin Biological Laboratory, Honolulu, Hawaii.

At La Jolla, where there are no facilities for holding captive tuna, research is being done from the Bureau's research vessels. Research on the vessels is focused on the response of the fish to fishing gear, its behavior during the entire fishing operation, and its attempts to escape a net.

After the tuna are caught by the Bureau's research vessel, they are inspected for damage and if found to be all right are lowered into a portable tank aboard the vessel. The line holding each fish is slackened, allowing the tuna to "throw off" the hook.

When the tank has its quota, the vessel heads for its home port of Honolulu. At Honolulu, the portable tank is moved by crane from vessel to shoreside tanks of the Bureau's Kewalo Basin Biological Laboratory where they are trained and studied. The portable tank is lowered into the larger tank and the tuna allowed to swim out of the smaller one.

While in the tank, tuna that may naturally swim counterclockwise can be trained to alter that pattern at the sound of a buzzer and make sharp turns through an opening in a barrier net. They can also be trained to respond to vertical and horizontal patterns of light. When one pattern is shown to the tuna and it makes a correct move, it is rewarded with food; when the tuna makes a wrong move, it receives an electric shock.

Fishing for Tuna: Practical information of much value to the United States tuna fishing fleet has already come out of the Bureau's research. The information helps answer two important questions. (1) Where in the vast ocean is one most likely to find tuna? and (2) How far down should one drop his nets? Tuna live in the warm upper layers of the ocean, and they are sensitive to temperature changes. Their distribution and movements vary from month to month because features in their environment change as they follow their food sources.

In the eastern Pacific, the upper 500 feet of the ocean is not as uniform in temperature as the atmosphere above the sea. The ocean contains a layer or zone of water called the thermocline, where there is a rapid change

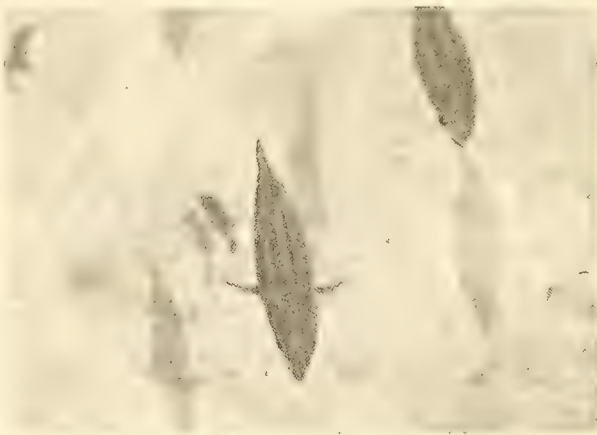


Fig. 2 - Two-pound skipjack tuna in shoreside tank.

in temperature with depth. Bureau scientists have learned that where these sandwiched cold-water layers occur less than 50 feet from the surface, and where the temperature change is very rapid, the chances of catching tuna with a purse seine are improved by 65 percent. The depth of the thermocline is located with a bathythermograph (BT), a device that also records temperature. Based on Bureau's success with that instrument, more and more commercial tuna vessels are being equipped with it.

The Bureau already has achieved what it calls "fair reliability" in predicting the whereabouts and abundance of skipjack tuna in the waters off Hawaii, and of albacore and bluefin tuna along the West Coast. The scientists base their predictions on the time in early spring when the ocean begins to warm and on changes in the movement of the different types of water. They then can predict when the fish are likely to show up, in what abundance, and whether they will be early or late in reaching the area. As the researchers learn more about the interrelations between tuna and the ocean, their predictions will become more precise.

Tuna Research in the Ocean: Tuna research work in the Pacific Ocean is being carried on by the Bureau's research vessels Charles H. Gilbert and Townsend Cromwell, which are equipped with observation chambers below the waterline.

To the fishery scientists, the tuna's world is made up of schools, each composed of several tons of fish, usually of the same species and size. If a school is not feeding, it may swim along at 6 to 8 knots for hours, with bursts of speed up to 20 knots for short periods. Most of the time, tuna swim with their mouths open. This allows water containing oxygen to flush over their gills. Should a tuna stop swimming, it would suffocate.

Scientists study the response of tuna to different types of bait and the behavior of the bait. Bait that is silvery and fast moving, such as sardines and anchovies, is good. Live bait is better than dead bait, and the research vessel is equipped with tanks to keep bait alive.

Although skipjack tuna are a schooling species, they break ranks when food stimuli appear and pursue the prey as individuals. Superimposed over the 4 or 5 dark stripes running from tail to head of the skipjack are

alternating, vertical, dark and light bars. These bars fade slowly when the stimuli disappear and reappear when new food stimuli appear. The excitement of skipjack going after their food is described as a "feeding frenzy." Scientists also are interested in the reaction of tuna to specific sounds, particularly those associated with fishing operations. The sounds are transmitted to schools of tuna and their reactions are carefully observed.

Tuna Research in Holding Tanks: Doing research on tuna at sea has certain limitations. Tuna are fast and do not stay long enough in one spot to satisfy the scientists' need for close and continual study. The big problem, however, was how to keep tuna alive in tanks so that experiments could be conducted. This was achieved by the U. S. Bureau of Commercial Fisheries in 1960 when it found a way to eliminate manual handling of skipjack from the time of capture until they were placed in shoreside experimental tanks. With this technique the fish now live up to 6 months in captivity.

Research at the Bureau's Biological Laboratory at Honolulu emphasizes studies regarding tuna hearing and sight. When this knowledge is gained it may be useful in designing fishing gear less visible to fish. Although the Bureau believes some of its findings are tentative and cannot be applied over too broad a base, researchers are confident they have gathered much information that will pay off in greater fishing success for United States fishermen.



U. S. Fishing Vessels

U. S. FISHERMEN ADVISED BY COAST GUARD TO STUDY NEW INTERNATIONAL RULES OF THE ROAD:

United States fishermen operating in international waters were advised by the U. S. Coast Guard, March 8, 1965, to take a long look at the revised 1960 International Rules of the Road before they go into effect September 1, 1965. The new rules make substantial changes in light requirements, fog-signal procedures, and other important aspects of Rules of the Road for fishing vessels on the high seas.

One of the most important changes in the revised rules, the Coast Guard said, is in

Rule 9 which prescribes the navigation lights and shapes to be shown by fishing vessels in international waters. Under the new Rule 9 fishermen will be required to show either a red or a green light carried vertically in line over a white light. The red-over-white combination of lights will apply to a vessel fishing with lines or nets, except trolling lines, and the green-over-white arrangement will indicate a vessel trawling. This is in sharp contrast to the present rule which requires use of a single all round white light, a vertical triangular pattern of white lights, or a tri-colored lantern. Under the new rule most fishermen operating on the high seas will have to mount new lights, the Coast Guard said.

Instead of the basket used under existing rules as a day shape to show a vessel engaged in fishing, fishermen under the new Rule 9 will have to use a black shape, consisting of two cones with their points together, vertically aligned one over the other.

The Coast Guard also called attention to important changes in fog-signal procedures under the revised International Rules of the Road. They will require that vessels engaged in fishing, under way, or at anchor in restricted visibility sound "... at intervals of not more than 1 minute, three blasts in succession, namely one prolonged blast followed by 2 short blasts."

The foregoing changes, however, are only a small sampling of the many important modifications in the revised rules. To be on the safe side the Coast Guard urged that fishermen familiarize themselves with the 1960 International Rules of the Road under which many will have to operate after September 1, 1965.

The revised rules will not apply to waters governed by the Inland, Great Lakes, and Western Rivers Rules of the Road, the Coast Guard said. (U. S. Coast Guard, March 8, 1965.)

Note: Advance copies of the revised 1960 International Rules of the Road may be obtained from local Coast Guard Marine Inspection Offices or by writing to the Commandant (MVI-4), 1300 E Street NW., Washington, D.C. 20226. Coast Guard Marine Inspection Offices located in most of the major United States ports will be able to answer questions on the new regulations.

* * * * *

FISHERIES LOAN FUND AND OTHER FINANCIAL AID FOR VESSELS, JANUARY 1-MARCH 31, 1965:

From the beginning of the program in 1956 through March 31, 1965, a total of 1,614 applications for \$42,125,872 was received by

the U. S. Bureau of Commercial Fisheries, the agency administering the Federal Fisheries Loan Fund. By that date, 849 applications (\$18,982,544) had been approved, 535 (\$12,764,477) had been declined or found ineligible, 199 (\$7,768,392) had been withdrawn by the applicants before being processed, and 31 (\$596,685) were pending. Of the applications approved, 318 were approved for amounts less than applied for--the total reduction was \$2,013,474.

The following loans were approved from January 1 through March 31, 1965:

New England Area: Waldo D. Preston, Cape Elizabeth, Me., \$2,500; George A. Beal, Friendship, Me., \$1,000; Freeman C. Robinson, Vinalhaven, Me., \$5,242; and Mac Jac Corp., Atlantic City, N. J., \$9,900.

California: Joe Lewis Queen, Costa Mesa, \$7,770; James N. Blum, Eureka, \$40,000; Donald A. Koski, Fort Bragg, \$22,000; Fred A. Cefalu, Morro Bay, \$5,500; James N. Quisenberry, Rosemead, \$10,584; Everingham Bros. Bait Co., San Diego, \$75,000; George M. Gibney, Sausalito, \$10,362; and Stanley Haskin, Watsonville, \$29,257.

Pacific Northwest Area: Henry Kreitzberg, Portland, Oreg., \$15,000; Henry F. Eaton, Seattle, Wash., \$19,499; Ray Lunde, Seattle, Wash., \$14,800; and Ole Westby, Seattle, Wash., \$14,442.

Alaska: Turi Kivisto, Cordova, \$2,150; Barney J. Corgatelli, Jr., Kodiak, \$11,046; Lawrence Finlay, Kodiak, \$6,400; and Elwood E. Mathews, Sitka, \$8,502.

Great Lakes Area: Lewis O. Brooks and Harry F. Day, Cheboygan, Mich., \$15,000.

Under the Fishing Vessel Mortgage Insurance Program (also administered by the Bureau) during the first quarter of 1965, a total of 8 applications for \$872,835 was received. Since the program began (July 5, 1960), 72 applications were received for \$7,242,748. Of the total, 56 applications were approved for \$3,926,663 and 10 applications for \$2,637,835 were pending as of March 31, 1965. Since the mortgage program began, applications received and approved by area are:

New England Area: Received 13 (\$1,464,500), approved 9 (\$1,034,928).

California: Received 2 (\$1,262,000), approved 1 (\$557,000).

South Atlantic and Gulf Area: Received 44 (\$2,579,402), approved 38 (\$1,753,665).

Pacific Northwest Area: Received 8 (\$1,861,250), approved 5 (\$526,296).

Alaska: Received 5 (\$75,596), approved 3 (\$54,774).

The first applications for a Fishing Vessel Construction Differential Subsidy under the Bureau's expanded program were received December 1964. Through March 31, 1965, a total of 25 applications for \$3,600,000 had been received. Public hearings were held on 13 applications during that period, and one invitation to bid on a vessel has been released.

Note: See Commercial Fisheries Review, March 1965 p. 55.

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DOCUMENTATIONS ISSUED AND CANCELLED:

December 1964: During December 1964, a total of 29 vessels of 5 net tons and over

Table 1 - U. S. Fishing Vessels 1/-Documents Issued and Cancelled, by Areas, December 1964 with Comparisons

Area (Home Port)	December		Total	
	1964	1963	1964	1963
(Number)				
Issued first documents 2/:				
New England	1	2	33	23
Middle Atlantic	1	1	11	18
Chesapeake	-	6	39	66
South Atlantic	4	6	50	77
Gulf	16	10	221	239
Pacific	6	8	141	160
Great Lakes	1	-	4	5
Hawaii	-	-	2	-
Puerto Rico	-	-	2	2
Total	29	33	503	590
Removed from documenta- tion 3/:				
New England	2	5	53	48
Middle Atlantic	1	3	27	47
Chesapeake	-	2	29	25
South Atlantic	8	4	62	53
Gulf	11	7	106	118
Pacific	11	5	151	87
Great Lakes	1	1	14	15
Hawaii	-	-	-	3
Total	34	27	442	396

Note: For explanation of footnotes, see table 4.

Table 2 - U. S. Fishing Vessels--Documents Issued by Tonnage and Area, December 1964 2/

Gross Tonnage	New England	Middle Atlantic	South Atlantic	Gulf	Pacific	Great Lakes	Total
(Number)							
5-9	-	-	-	2	-	-	2
10-19	-	-	-	3	3	1	7
20-29	-	1	-	1	-	-	2
40-49	-	-	-	-	1	-	1
50-59	-	-	-	-	1	-	1
60-69	-	-	-	2	-	-	2
70-79	-	-	1	1	-	-	2
80-89	-	-	1	7	-	-	8
90-99	-	-	2	-	-	-	2
110-119	1	-	-	-	-	-	1
160-169	-	-	-	-	1	-	1
Total	1	1	4	16	6	1	29

Note: For explanation of footnote, see table 4.

Table 3 - U.S. Fishing Vessels--Documents Issued by Vessel Length and Area, December 1964 2/

Length in feet	New England	Middle Atlantic	South Atlantic	Gulf	Pacific	Great Lakes	Total
(Number)							
27	-	-	-	1	-	-	1
31	-	-	-	-	2	1	3
33	-	-	-	1	-	-	1
34	-	-	-	1	-	-	1
38	-	-	-	2	-	-	2
39	-	-	-	-	1	-	1
45	-	-	-	1	-	-	1
46	-	-	-	-	1	-	1
49	-	-	-	-	1	-	1
50	-	1	-	-	-	-	1
62	-	-	-	2	-	-	2
63	-	-	-	1	-	-	1
64	-	-	-	1	-	-	1
66	-	-	2	5	-	-	7
67	-	-	2	1	-	-	3
73	1	-	-	-	-	-	1
82	-	-	-	-	1	-	1
Total	1	1	4	16	6	1	29

Note: For explanation of footnote, see table 4.

Table 4 - U.S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, December 1964 2/

Horsepower	New England	Middle Atlantic	South Atlantic	Gulf	Pacific	Great Lakes	Total
25	-	-	-	1	-	1	2
86	-	-	-	1	-	-	1
100-109	-	-	-	1	1	-	2
115	-	-	-	1	-	-	1
120	-	-	-	-	1	-	1
130	-	-	-	1	-	-	1
150	-	-	-	1	-	-	1
170	-	-	-	1	1	-	2
205	-	-	-	1	-	-	1
215	-	-	-	-	1	-	1
220-229	-	-	-	2	1	-	3
275	-	1	-	-	-	-	1
300	-	-	3	5	1	-	9
320	-	-	-	1	-	-	1
345	-	-	1	-	-	-	1
457	1	-	-	-	-	-	1
Total	1	1	4	16	6	1	29

1/Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2/There were 2 redocumented vessels in December 1964 previously removed from the records. Vessels issued first documents as fishing craft were built: 24 in 1964; 1 in 1962; 1 in 1959; and 3 prior to 1947.

3/Includes vessels reported lost, abandoned, forfeited, sold alien, etc. Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U. S. Treasury Department.

was issued first documents as fishing craft, as compared with 33 in December 1963. There were 34 documents cancelled for fishing vessels in December 1964, as compared with 27 in December 1963.

* * * * *

November 1964: During November 1964, a total of 32 vessels of 5 net tons and over was issued first documents as fishing craft, as compared with 37 in November 1963. There

were 44 documents cancelled for fishing vessels in November 1964, as compared with 29 in November 1963.

Table 1 - U. S. Fishing Vessels 1--Documentations Issued and Cancelled, by Areas, November 1964 with Comparisons

Area (Home Port)	November		Jan.-Nov.		Total
	1964	1963	1964	1963	1963
(Number)					
Issued first documents ² :					
New England	3	1	32	21	23
Middle Atlantic	1	1	10	17	18
Chesapeake	3	6	39	60	66
South Atlantic	7	6	46	71	77
Gulf	11	20	205	229	239
Pacific	5	2	135	152	160
Great Lakes	1	1	3	5	5
Hawaii	1	-	2	-	-
Puerto Rico	-	-	2	2	2
Total	32	37	474	557	590
Removed from documentation ³ :					
New England	9	2	45	43	48
Middle Atlantic	2	2	21	44	47
Chesapeake	1	4	20	23	25
South Atlantic	5	2	44	49	53
Gulf	13	11	75	111	118
Pacific	13	7	125	82	87
Great Lakes	1	1	10	14	15
Hawaii	-	-	-	3	3
Total	44	29	340	369	396

Note: For explanation of footnotes, see table 4.

Table 2 - U. S. Fishing Vessels--Documents Issued by Vessel Length and Area, November 1964 2/

Length in feet	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Hawaii	Total
(Number)									
28	1	-	-	-	-	-	-	-	1
29	1	-	-	-	1	1	-	-	3
30	-	-	-	-	-	1	-	-	1
31	-	-	-	-	-	1	-	-	1
34	-	-	-	1	1	-	1	-	3
35	-	-	-	-	2	-	-	1	3
36	-	-	1	-	-	-	-	-	1
37	-	-	-	-	-	1	-	-	1
38	-	-	1	-	-	-	-	-	1
40	-	-	1	-	1	-	-	-	2
44	-	1	-	-	-	-	-	-	1
49	-	-	-	1	-	-	-	-	1
51	-	-	-	-	1	-	-	-	1
62	-	-	-	-	1	-	-	-	1
64	-	-	-	-	1	-	-	-	1
66	-	-	-	3	3	-	-	-	6
67	-	-	-	2	-	-	-	-	2
104	1	-	-	-	-	-	-	-	1
128	-	-	-	-	-	1	-	-	1
Total	3	1	3	7	11	5	1	1	32

Note: For explanation of footnote, see table 4.

Table 3 - U. S. Fishing Vessels--Documents Issued by Tonnage and Area, November 1964 2/

Gross Tonnage	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Hawaii	Total
(Number)									
5-9	2	-	1	2	1	1	-	-	7
10-19	-	1	2	-	3	3	1	1	11
20-29	-	-	-	-	1	-	-	-	1
40-49	-	-	-	1	1	-	-	-	2
60-69	-	-	-	-	1	-	-	-	1
70-79	-	-	-	-	1	-	-	-	1
80-89	-	-	-	-	3	-	-	-	3
90-99	-	-	-	4	-	-	-	-	4
130-139	1	-	-	-	-	-	-	-	1
430-439	-	-	-	-	-	1	-	-	1
Total	3	1	3	7	11	5	1	1	32

Note: For explanation of footnotes, see table 4.

Table 4 - U. S. Fishing Vessels--Documents Issued by Vessel Horsepower and Area, November 1964 2/

Horse- power	New England	Middle Atlantic	Chesa- peake	South Atlantic	Gulf	Pacific	Great Lakes	Hawaii	Total
(Number)									
25	-	-	-	-	-	1	-	-	1
60	-	-	-	1	-	-	-	-	1
100-119	1	-	-	-	2	1	-	-	4
120-129	-	-	-	-	-	2	1	-	3
130	-	-	-	-	1	-	-	-	1
150	-	-	1	-	-	-	-	-	2
160-169	1	1	1	1	1	-	-	-	5
170	-	-	-	-	1	-	-	-	1
180	-	-	-	-	1	-	-	-	1
220-229	-	-	-	-	1	-	-	1	2
250	1	-	-	-	-	-	-	-	1
300	-	-	-	5	3	-	-	-	8
420	-	-	1	-	-	-	-	-	1
1050	-	-	-	-	-	1	-	-	1
Total	3	1	3	7	11	5	1	1	32

1. Includes both commercial and sport fishing craft. A vessel is defined as a craft of 5 net tons and over.

2. There were 4 redocumented vessels in November 1964 previously removed from the records. Vessels issued first documents as fishing craft were built, 22 in 1964, 1 in 1959, 1 in 1947, and 5 prior to 1947.

3. Includes vessels reported lost, abandoned, forfeited, sold alien, etc.

Source: Monthly Supplement to Merchant Vessels of the United States, Bureau of Customs, U.S. Treasury Department.

THREE NEW U. S.-BUILT SHRIMP TRAWLERS OPERATING OFF SOUTH AMERICA:

Three new United States-built shrimp trawlers are now operating on shrimp grounds off South America. They were the first vessels of a fleet costing \$1 million being built at a shipyard in Rockport, Tex., for a group of Florida firms. The vessels operate out of



Cayenne, French Guiana, where one of the owning companies has a new shrimp-processing plant.

The fleet has been specially designed by the Texas shipyard's general manager. The vessels are 72 feet in length, with steel hulls, and powered by diesel engines.

Like other United States shrimp vessels that are fishing South American shrimp grounds, the three new trawlers are manned by skeleton American crews, with deckhands to be recruited from the Guianas or West Indies. (*Fishing News*, London, February 26, 1965.)



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-February 27, 1965, amounted to 4,175,915 pounds (about 198,853 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was about the same as the 4,234,009 pounds (about 201,619 standard cases) imported during January 1-February 29, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty has not been announced; however, in 1964 the quota was 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota would have been dutiable at 25 percent ad valorem.

* * * * *

AIRBORNE IMPORTS OF FISHERY PRODUCTS, DECEMBER 1964:

Airborne fishery imports into the United States in December 1964 were up considerably from the previous month due to much larger shipments of shrimp from Venezuela.

Airborne fishery imports in the year 1964 totaled 10.6 million pounds with a value of \$5.7 million, a small increase over 1963.

Shrimp shipments by air from Venezuela were heavy throughout 1964 and accounted for 67 percent of the quantity and 61 percent of the value of the airborne fishery imports in

1964. Airborne shrimp shipments from other Caribbean countries declined in 1964 in line with a trend that started in 1963. (It is thought that some of the Caribbean shrimp producers have shifted to other means of transport.) The bulk of the 1964 airborne shrimp imports entered through the Customs District of Florida and consisted of fresh and frozen raw headless shrimp.

The main shellfish items other than shrimp imported by air in 1964 were northern lobsters from Canada and spiny lobster products from Central and South American countries. British Honduras is the leading supplier of airborne imports of spiny lobsters.

U. S. 1/Airborne Imports of Fishery Products, December 1964 and Years 1963-1964						
Product and Origin 2/	December 1964		Year 1964		Year 1963	
	Qty. 3/	Value 4/	Qty. 3/	Value 4/	Qty. 3/	Value 4/
	Lbs.	US\$ 1,000	Lbs.	US\$ 1,000	Lbs.	US\$ 1,000
Fish:						
Mexico	-	-	320.5	64.7	264.8	70.0
Canada	-	-	14.8	4.8	2.2	0.9
Other countries	20.1	7.9	102.8	68.8	109.5	122.6
Total fish	20.1	7.9	438.1	138.3	376.5	193.5
Shrimp:						
Guatemala	-	-	-	-	141.6	74.0
El Salvador	-	-	170.2	102.8	338.0	219.0
Honduras	-	-	10.3	3.8	99.8	52.3
Nicaragua	-	-	97.5	55.8	517.3	181.3
Costa Rica	40.2	20.5	350.4	187.3	644.8	308.4
Panama	192.5	124.0	1,262.9	789.4	1,633.0	890.2
Venezuela	1,314.7	687.4	7,120.4	3,486.9	5,048.2	2,297.9
Ecuador	-	-	-	-	111.6	39.4
France	-	-	-	-	2.6	0.9
British Guiana	-	-	10.5	5.2	-	-
Mexico	-	-	2.1	1.4	13.2	6.9
Other countries	-	-	13.1	6.9	19.1	11.5
Total shrimp	1,547.4	831.9	9,037.4	4,639.5	8,569.2	4,081.8
Shellfish other than shrimp:						
Canada	-	0.9	316.6	175.2	213.3	109.2
Mexico	-	-	14.4	9.9	101.1	60.8
British Honduras	65.9	79.2	368.5	337.3	378.6	311.1
Honduras	-	-	80.3	82.6	17.0	7.0
Nicaragua	20.2	29.1	70.7	69.1	183.2	113.3
Costa Rica	43.0	40.0	62.1	54.7	73.8	60.1
Jamaica	12.3	20.2	75.6	83.4	86.6	67.3
Other countries	19.7	22.4	128.3	104.6	131.8	111.1
Total	162.0	191.4	1,116.5	916.8	1,185.4	839.9
Grand total	1,729.5	1,031.2	10,592.0	5,694.6	10,131.1	5,115.2

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.

2/When the country of origin is not known, the country of shipment is shown.

3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.

4/F.o.b. point of shipment. Does not include U.S. import duties, air freight, or insurance.

Note: These data are included in the overall import figures for total imports, i.e., these imports are not to be added to other import data published.

Source: *United States Airborne General Imports of Merchandise*, FT 380, December 1964, U.S. Bureau of the Census.

Fish fillets from Mexico were the leading finfish product (from a volume standpoint) imported by air in 1964 and 1963.

The airborne imports in both years included several high-value shipments of caviar.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, DECEMBER 1964:

United States imports of processed edible fishery products in December 1964 were up 7 percent in quantity and 4 percent in value from those in the previous month due mainly to larger imports of canned tuna, canned sardines, and canned oysters. The gain was partly offset by smaller imports of cod fillets, sea catfish fillets, and canned crab meat.

Compared with the same month in 1963, imports in December 1964 were up 25 percent in quantity and 26 percent in value. The increase extended to most fishery items, particularly groundfish fillets and blocks, flounder fillets, canned albacore tuna, canned sardines, and canned oysters. There was some decline in imports of canned tuna other than albacore.

U.S. Imports and Exports of Processed Edible Fishery Products, December 1964 with Comparisons								
Item	QUANTITY				VALUE			
	Dec.		Jan.-Dec.		Dec.		Jan.-Dec.	
	1964	1963	1964	1963	1964	1963	1964	1963
	.. (Millions of Lbs.) ..				.. (Millions of \$) ..			
Fish & Shellfish:								
Imports ^{1/}	53.6	42.9	551.3	536.3	17.3	13.7	169.1	157.4
Exports ^{2/}	5.9	4.3	50.9	34.5	3.0	2.1	26.6	16.6
^{1/} Includes only those fishery products classified by the U.S. Bureau of Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).								
^{2/} Excludes fresh and frozen.								

In January-December 1964, imports were up 3 percent in quantity and 7 percent in value from those in January-December 1963. During January-December 1964, there were larger imports of groundfish blocks (increase mainly from Canada and Iceland), flounder fillets, yellow pike fillets, and sea catfish fillets. Imports were also up for canned albacore tuna and canned sardines not in oil. But there was a decline in imports of most other canned fish import items (tuna other than albacore, crab meat, oysters, salmon, and sardines in oil).

Exports of processed edible fish and shellfish from the United States in December 1964 were down 12 percent in quantity and 9 percent in value from the previous month due mainly to lower shipments of canned salmon, sardines, and canned shrimp. In December 1964, shipments of canned salmon to the United Kingdom increased 6 percent but those to other countries were down 48 percent.

Compared with the same month of 1963, the exports in December 1964 were up 37 percent in quantity and 43 percent in value. The increase was due mainly to larger shipments of canned salmon and canned squid. Shipments of canned squid to Greece were down sharply compared with December 1963 but those to the Philippines were up about 800 percent.

Processed fish and shellfish exports for the 12 months of 1964 were up 48 percent in quantity and 60 percent in value from those in the same period of 1963. In 1964 there were much larger shipments of canned mackerel and canned salmon. Exports of canned shrimp and canned sardines in oil were also higher, but exports of canned sardines not in oil and canned squid (to Greece and the Philippines) were down.



Wholesale Prices

EDIBLE FISH AND SHELLFISH, MARCH 1965:

From February to March 1965, prices were seasonally lower for nearly all of the major fishery products listed in the wholesale price index. The March 1965 wholesale price index for edible fish and shellfish (fresh, frozen, and canned) at 108.3 percent of the 1957-59 average was down 1.3 percent from the previous month. Compared with March 1964, prices for a number of the major items were substantially higher this March with the overall index up 4.0 percent.

In the subgroup for drawn, dressed, or whole finfish, ex-vessel prices at Boston for large haddock in March 1965 dropped 11.8 percent from the previous month as a result of the usual seasonal increase in landings. Prices were lower at New York City for western frozen king salmon (down 2.9 percent), and prices at Chicago for Fresh Lake Superior whitefish were down from the high of the previous month. But Great Lakes round yellow pike wholesale prices were up 5 cents a pound because of very light supplies. From February to March 1965 the subgroup index was down 3.7 percent, but was 9.8 percent higher than

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, March 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			Mar. 1965	Feb. 1965	Mar. 1965	Feb. 1965	Jan. 1965	Mar. 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.3	109.7	112.1	104.1
Fresh & Frozen Fishery Products:					112.5	114.5	118.3	105.5
Drawn, Dressed, or Whole Finfish:					110.8	115.1	121.8	100.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.11	.13	87.4	99.2	133.3	61.8
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.40	.40	117.3	117.3	118.3	89.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.85	115.3	118.8	119.1	114.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.63	.65	93.3	96.3	90.3	108.2
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.85	.80	139.2	131.0	122.8	114.7
Processed, Fresh (Fish & Shellfish):					112.3	115.1	116.0	116.1
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.40	.44	97.1	105.6	134.8	77.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.95	.97	111.3	113.7	109.6	113.1
Oysters, shucked, standards	Norfolk	gal.	6.88	7.00	115.9	118.0	120.1	126.5
Processed, Frozen (Fish & Shellfish):					109.3	108.6	111.8	96.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.35	95.0	88.7	92.5	98.9
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.39	.39	112.9	114.3	115.8	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.31	.31	108.7	108.7	106.9	114.0
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.92	.91	108.5	107.9	112.1	87.2
Canned Fishery Products:					101.3	101.8	101.8	102.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	20.50	21.00	89.3	91.5	91.5	94.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.44	11.56	101.6	102.6	102.6	103.3
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	6.25	120.9	105.9	105.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.00	10.00	128.3	128.3	128.3	118.2

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

in March 1964 due to sharply higher prices this March for ex-vessel haddock and frozen halibut.

Prices for all items in the processed fresh fish and shellfish subgroup dropped from February to March 1965, with the subgroup index down 2.4 percent. The more significant price declines were for fresh small haddock fillets at Boston (down 8.0 percent), followed by lower prices at New York City for fresh South Atlantic shrimp (down 2.1 percent), and a slight drop in prices for shucked standard oysters. As compared with the same month a year earlier, the subgroup index this March was lower by 3.3 percent because of lower prices for fresh shrimp and oysters which were partially offset by much higher prices this March for fresh haddock fillets (up 25 percent from March 1964).

The March 1965 subgroup index for processed frozen fish and shellfish rose only 0.6 percent from the previous month. But prices for frozen flounder fillets were up 7.1 percent in that period and for frozen shrimp at Chicago up 0.6 percent. The subgroup index this

March was 13.6 percent higher than in March 1964 chiefly because of substantially higher prices for frozen shrimp (up 24.4 percent) and frozen haddock fillets (up 4.1 percent).

Lower prices for canned pink salmon and canned tuna in March 1965 were responsible for a 0.5-percent drop from the previous month in the subgroup index for canned fishery products. Lower prices for canned pink salmon were established as a spur to increased sales and to continue the good movement of canners' stocks. Canned tuna prices for advertised brands were unchanged from the previous month, but slightly lower prices for "other packers' labels" caused a 1-percent drop in the average canned tuna price. California canneries paid more for ex-vessel jack mackerel in March and prices for the canned product rose 14.2 percent above the previous month. As compared with the same month a year earlier, prices in March 1965 were higher for canned Maine sardines and jack mackerel. But those higher prices were offset by lower prices for canned pink salmon and canned tuna, and this March the subgroup index was down 0.9 percent from March 1964.





International

FISH MEAL

WORLD PRODUCTION, JANUARY 1965 WITH COMPARISONS:

The high level of fish meal production in Peru was the dominant factor in world fish meal production in December 1964 and January 1965 as output in the United States and several other countries declined seasonally. World output in January 1965 showed a modest decline from the same month in the previous year due to lower production in Chile, South Africa, Norway, Iceland, West Germany, and Denmark.

World fish meal production in 1964 was considerably above that in 1963. The increase was due largely to expanded production in Peru. Higher production in 1964 was also reported in Norway, South Africa, Chile, Iceland, Angola, and Denmark. The increase

was partly offset by lower production in Canada and the United States.

Most of the principal countries producing fish meal submit data to the International Association of Fish Meal Manufacturers monthly (see table).

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, 1963-64:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

World Fish Meal Production by Countries, January 1965,
December 1964, and Year 1964 with Comparisons

Country	Jan.		Dec.	Jan.-Dec.	
	1965	1964	1964	1964	1963
(Metric Tons)					
Canada	5,441	3,405	5,621	56,215	77,436
Denmark	5,887	8,799	5,161	109,687	100,001
France	1,100	1,100	1,100	13,200	13,200
German Fed. Rep.	4,635	6,757	5,116	73,900	73,997
Netherlands	1/	800	1/	2/6,700	6,800
Spain	1/	1/	1/	1/	3/21,687
Sweden	590	1,070	622	7,600	6,636
United Kingdom	7,259	7,736	5,720	74,813	75,331
United States	2,512	1,667	6,610	189,553	4/232,133
Angola	1/	5,548	6,985	59,701	31,829
Iceland	4,200	5,736	9,253	127,739	87,730
Norway	5,894	8,607	10,172	185,901	131,546
Peru	194,104	195,551	180,979	1,552,214	1,159,233
So. Afr. (incl. S.-W. Afr.)	8,744	14,302	1,075	4/257,440	238,269
Belgium	375	375	375	4,500	4,500
Chile	12,855	21,848	9,836	144,456	92,715
Morocco	1/	270	1/	5/18,450	6/19,000
Total	253,596	283,571	248,625	2,882,069	2,372,043

1/Data not available.

2/Data available only for Jan.-Oct. 1964.

3/Data available only for Jan.-Nov. 1963.

4/Revised.

5/Data available only for Jan.-Nov. 1964.

6/Estimated.

Note: Japan does not report fish meal production to the International Association of Fish Meal Manufacturers at present.

Table 1 - Exports of Fish Meal by Member Countries
of the FEO, 1963-64

Country	Oct.		Nov.		Dec.		Jan.-Dec.	
	1964	1963	1964	1963	1964	1963	1964	1963
(1,000 Metric Tons)								
Chile	9.3	2.8	12.4	1.2	11.6	3.8	137.8	86.8
Angola	4.8	3.6	4.2	1.8	4.0	7.0	56.0	30.0
Iceland	10.9	10.2	10.9	14.7	12.4	17.6	124.3	99.1
Norway	12.8	12.1	14.4	15.9	9.1	18.1	179.4	102.1
Peru	84.4	83.3	109.7	90.4	123.8	104.7	1,416.5	1,159.3
So. Africa (including S.-W. Africa)	25.5	40.9	18.7	18.3	13.7	13.4	226.5	198.8
Total	147.7	152.9	170.3	142.3	174.6	164.6	2,140.5	1,678.0

The FAO countries produced 2.3 million metric tons of fish meal in 1964 or about 70 percent of total world production estimated at 3.3 million tons.

Table 2 - Production of Fish Meal by Member Countries
of the FEO, 1963-64

Country	Oct.		Nov.		Dec.		Jan.-Dec.	
	1964	1963	1964	1963	1964	1963	1964	1963
(1,000 Metric Tons)								
Chile	10.7	0.9	9.6	3.7	9.8	13.1	147.0	92.7
Angola	5.4	3.6	5.2	3.0	5.0	7.4	57.0	31.5
Iceland	13.1	0.9	3.2	0.8	9.3	8.7	127.7	87.7
Norway	15.8	7.8	13.1	12.1	10.2	9.6	185.9	132.2
Peru	130.5	76.8	181.7	116.1	181.0	139.7	1,552.2	1,159.2
So. Africa (including S.-W. Africa)	16.0	17.0	9.0	3.8	1.0	1.2	257.4	238.0
Total	191.5	107.0	221.8	139.5	216.3	179.7	2,327.9	1,741.3

1/Estimated.

Note: Because of rounding, some totals do not add.

International (Contd.):

Total fish meal exports by FEO countries in 1964 totaled 2.1 million tons, an increase of about 28 percent from the previous year. In 1964, Peru accounted for about 66 percent of total fish meal exports reported by FEO countries.

SALMON

JAPAN AND U.S.S.R.
SALMON CATCH IN 1964:

The Japanese Fisheries Agency on February 8, 1965, released Japan's 1964 salmon catch data compiled in preparation for the Ninth Annual Meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.), which convened March 2. According to the Agency's tabulations, Japan's 1964 salmon catch totaled 105,035 metric tons.



Aboard a Japanese fishing vessel in North Pacific, pulling in a gill net and removing salmon.

Japan and U.S.S.R. Salmon Catch by Species, 1964						
Fishery	Red	Chum	Pink	Silver	King	Total
. (Metric Tons)						
Japan:						
Mothership fishery	14,125	17,896	3,048	8,250	1,130	44,449
Land-based gill-net fishery	160	14,797	15,716	4,252	789	35,714
Land-based long-line fishery	12	3,184	7,296	13	54	10,559
Japan Sea & Pacific coastal fishery	6	4,870	9,293	50	94	14,313
Total	14,303	40,747	35,353	12,565	2,067	105,035
U.S.S.R.:						
Far Eastern coastal fishery	2,692	27,794	14,678	1,118	1,431	47,715
1/Includes 9,012 metric tons taken in Area A (north of 45° N. latitude).						

The Agency also announced that the 1964 Soviet Far Eastern coastal salmon catch totaled 47,715 metric tons (26 percent below that country's catch target of 65,000 tons), a postwar record low. The Russian salmon catch in 1963 totaled 81,130 metric tons. (Suisan Keizai Shimbun, February 16; Hokkai Suisan, February 15, 1965.)

FOOD AND AGRICULTURE ORGANIZATION

THIRD INTERNATIONAL TECHNICAL
MEETING ON FISHING BOATS:

The needs of developing countries for smaller fishing craft (under 100 gross tons) especially adaptable for fishing their own local waters will be the theme of the Food and Agriculture Organization's (FAO) 3rd International Technical Meeting on Fishing Boats, to be held at Göteborg, Sweden, October 23-29, 1965. The meeting is in conjunction with the 3rd Swedish International Fishery Trade Fair, also to be held at Göteborg, October 29-November 7.

In an interview, Chief of FAO's Fishing Boat Section and technical secretary for the Göteborg meeting said:

"The importance of these smaller craft is simply that they so greatly outnumber the larger boats in the world's fisheries. The small boats pose many interesting and difficult technical problems. They are products of local development, designed both from tradition and from a need to meet local conditions, while making use of local materials. What we hope to accomplish at Göteborg is to come up with ideas and recommendations that will enable us to set better standards for the smaller boats." Naval architects and marine engineers so far have devoted little time to such smaller craft. Yet they have an importance

International (Contd.):

that cannot be overlooked if fishing is to progress in the developing nations, as well as in developed nations, he said.

The prospectus for the Göteborg meeting calls for a review of technical progress in naval architecture and marine engineering. Delegates will review current developments in fishing vessel design and prospects for the future, the social and economic background affecting fishing in the developing nations, the seaworthy aspects and workability of small craft, powering and engineering, as well as a breakdown of design problems covering vessels of 20 gross tons and under, and those of 20 to 100 gross tons. Mechanization of native craft with outboards will also be studied.

The head of FAO's Fishing Boat Section pointed out that since 1947 when the first international meeting on fishing boats was held at Göteborg, FAO has undertaken a number of missions to help developing countries improve the designs of their fishing vessels. Several thousand vessels had been built from FAO designs and, although this was not a great number, a wealth of experience has been gained, much of which would be reviewed during the coming meeting. A number of specialized meetings on fishing-vessel design have been held in various parts of the world, he said. Among the FAO-sponsored meetings were: the 1st FAO Fishing Boat Congress, held in Paris and Miami in 1953; the 2nd Congress in Rome in 1959; the FAO Research Vessel Forum at Tokyo in 1961; the Indo-Pacific Fisheries Council/FAO Symposium on Mechanization of Fishing Craft at Seoul in 1962; and the FAO Fishing Vessel Stability Meeting at Gdańsk, Poland, in 1963. In addition, the 1st and 2nd FAO Fishing Gear Congresses, held at Hamburg in 1947 and London in 1963, dealt with certain aspects of fishing-vessel design.

About 300 participants from some 30 countries are expected to attend the Göteborg meeting. About 35 technical papers will be presented, several of them by FAO experts. (Food and Agriculture Organization, Rome, February 1965.)

Note: See Commercial Fisheries Review, Sept. 1964 p. 64, Aug. 1963 p. 67.

* * * * *

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH MEETS IN ROME:

How to promote a more rational exploitation of the world's ocean resources was discussed by 15 fisheries scientists from 11 nations at the 3rd Session of the Advisory Committee on Marine Resources Research, Food and Agriculture Organization (FAO), held in Rome, March 1-8, 1965. Set up in 1963, the Committee's principal function is to help FAO in establishing a worldwide program of research into the resources of the sea. Another of its functions is to advise on how to improve international cooperation in using the living resources of the sea.

Speaking before the Committee's opening session, Dr. B. R. Sen, FAO's Director-General said that international cooperation was a "must" if the living resources of the sea are to be rationally exploited. He cited the declining Antarctic whale stocks as an example of what can happen in other important fisheries unless the nations agree to a truly international long-term planning of the world sea harvest.

"In the 12 months since this Advisory Committee last met," the Director-General said, "we have seen the International Whaling Commission fail to achieve agreement for the conservation of these severely depleted stocks, with the result that once again they will be overexploited by the powerful whaling fleets of several nations. The case of the Antarctic whales is important to me in its own right, as we see a large food resource being destroyed." Perhaps more important, he said, was that failure to secure rational exploitation in this case might weaken other international efforts aimed at securing wiser management of the world's marine resources.

Some countries are presently attempting to convene an extraordinary meeting of the Whaling Commission to deal with the problem, he added. If such an extraordinary meeting were held and again failed to solve the Antarctic whale problem, FAO was willing, at the request of member governments, to call an emergency meeting of the countries directly concerned, the Director-General said. He also told the Advisory Committee's 15 scientists that he would propose to FAO's next Conference, which is to be held in November 1965, the establishment of a permanent com-

International (Contd.):

mittee on fisheries and a major strengthening of FAO work in fisheries.

One of the proposed committee's principal tasks, he said, would be periodically "to conduct general reviews of fishery problems of an international character and to suggest measures for their solution."

Strengthening of FAO's work in fisheries was necessary, he said, "to cope with the enormously increased demand on FAO resulting from the situation in world fisheries."

"The situation is becoming more and more complex; it requires not only a rational planning for long-term development, but in certain cases emergency action."

Following Dr. Sen's remarks, Roy Jackson, Director of FAO's Division of Fisheries told the meeting that expansion of the organization's work in fisheries was imperative if FAO was to be of maximum use to the fishing nations, particularly the developing ones.

"The problems are still arising faster than we can even begin to consider them, let alone solve them. This is our present situation," he said.

Among the priorities, he said, were the need for more research on stocks and fish population dynamics, studies on the growing pollution of marine waters, strengthening FAO's field program in fisheries, and the launching of the World Program of Marine Resources Research, proposed last year by Dr. Sen.

At the 1965 Session the Committee also reviewed the fisheries aspects of the pollution of marine waters and the work of FAO's various regional fisheries councils and commissions, and advised FAO on its proposed program of work in fisheries research and management for 1966/67.

The 3rd Session of the Committee was preceded by a meeting held February 25-28 of the Committee's working group on direct and more speedy estimation of fish abundance.

The Advisory Committee meets once a year and reports its findings to the FAO Director-General. Its members are from Argentina, Australia, Canada, the Federal Republic of Germany, Ghana, India, Japan, the Nether-

lands, Poland, the United Kingdom, the United States, and the Soviet Union. The scientists are appointed to the Committee by the FAO Director-General on the basis of their expert knowledge, and not as representatives of their governments.

In addition to its FAO role, the Committee acts as the advisory group on the oceanographic aspects of fisheries to the InterGovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). (Food and Agriculture Organization Rome, February 26 and March 1, 1965.)

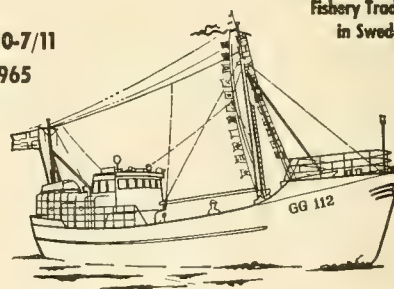
Note: See Commercial Fisheries Review, April 1964 p. 42.

FISHERY TRADE FAIR

THIRD SWEDISH INTERNATIONAL FAIR TO BE HELD AT GÖTEBORG:

The 3rd Swedish International Fishery Trade Fair will be held at Göteborg, October 29 to November 7, 1965, in the Swedish Trade Fair's exhibition halls (Svenska Massan).

29/10-7/11
1965



Welcome as exhibitor at



THE FAO WORLD CONGRESS REGARDING QUESTIONS OF FISHING BOATS

International (Contd.):

Products on display at the fair will be:

- (1) Fishing boats, lifeboats, liferafts, wheelhouses;
- (2) Engines, pumps, winches, steering gear, propellers;
- (3) Anchors, chains, fittings, cordage, tarpaulins;
- (4) Telephones, radios, direction-finders, electrical equipment;
- (5) Trawls, drift nets, and similar equipment;
- (6) Oilskins, boots, vests, gloves;
- (7) Freezing and refrigerating machines, gutting and cutting machines;
- (8) Conveyors, loading tables, packing machines, forklift trucks, scales;
- (9) Fuel and lubricants, paints and varnishes.

The 1st and 2nd Swedish International Fishery Trade Fairs were held at the same place and premises in 1961 and 1963, respectively.

The Food and Agriculture Organization (FAO) of the United Nations will, in conjunction with the Fair, hold a conference on fishing craft problems. About 300 representatives from 30 countries are expected to participate in the FAO conference, which is scheduled for October 23-29, 1965. Similar conferences have previously been held in Paris in 1953, and in Rome in 1959. (United States Consulate, Goteborg, February 18, 1965.)

NORTHWEST PACIFIC FISHERIES COMMISSION

JAPANESE AND SOVIET PRECONFERENCE VIEWS ON SALMON AND CRAB NEGOTIATIONS:

The U.S.S.R. is alarmed at the decline of the salmon catch in the northwest Pacific. That was a major point of a Soviet fishery negotiator who outlined Soviet views for the Japanese newspaper Hokkaido Shimbun prior to the opening on March 1, 1965, of the ninth annual meeting of the Northwest Pacific Fish-

eries Commission. (The Commission sets salmon and king crab catch quotas in western Pacific waters covered under a Japanese-Soviet treaty. Treaty waters north of 45° N. latitude are designated Area A; those south of 45° N. latitude are designated Area B.)



A catch of salmon aboard a Japanese high-seas mothership operating in the North Pacific Ocean during the salmon season.

Discussing salmon fishing, the Soviet negotiator in his article in the Japanese newspaper painted a pessimistic picture of the continuing decline of salmon resources: the combined Japanese and Soviet catch in Northwest Pacific Treaty waters in 1964 (about 155,000 metric tons) was less than half that of 8 to 10 years ago; the spawning migration of salmon was "insignificant;" and finally, the pink salmon catch in treaty waters (55,000 tons in 1964) was less than a quarter of that of a decade ago. This he found "alarming."

Soviet Salmon Catch in the Northwest Pacific, 1962-1964			
Species	Year		
	1964	1963	1962
	(Metric Tons)		
Red salmon . . .	2,692.1	3,442.0	4,649.0
Chum salmon . .	27,794.6	33,565.7	33,992.0
Pink salmon . .	14,678.8	35,766.7	16,284.0
Silver salmon . .	1,118.3	7,353.1	4,680.0
King salmon . .	1,431.3	1,003.3	960.0
Total . . .	47,715.1	81,130.8	60,565.0

Referring specifically to salmon fishing in the B-area, the Soviet negotiator cited his belief that the catch was small and costly, and the salmon runs declining steadily. Thus one task of the fisheries talks will be "to prevent the danger of extermination of salmon resources."

International (Contd.):

The Soviet negotiator also said that the regulation of crab fishing on the Asian Continental Shelf and the proper control of her-ring fishing in the Hokkaido-Sakhalin area were "pressing problems." (United States Consul, Sapporo, Japan, February 25, 1965.)

Japanese preconference views on the negotiations were summarized in the Japanese periodical Tokyo Shimbun, January 19, 1965. The main points were as follows:

The Japanese Government, with industry support, will insist on a Japanese salmon catch quota in 1965 for Areas A and B combined of 120,000 metric tons (the same as in 1963, but up 10,000 tons from 1964). In support of their position the Japanese cite the theory of alternating lean and good salmon seasons which indicates 1965 will be a good year. (United States Embassy, Tokyo, January 25, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 72; July 1964 p. 42; June 1964 p. 60.

NORTH PACIFIC FUR SEAL COMMISSION

8TH ANNUAL MEETING CONVENES IN TOKYO:

The 8th annual meeting of the North Pacific Fur Seal Commission was held in Tokyo, February 22-26, 1965, with the four governments which are Parties to the Interim Convention on Conservation of North Pacific Fur Seals participating. The Convention entered into force in 1957 on ratification by Canada, Japan, the Soviet Union, and the United States. It was the first meeting held by the Commission since the Convention was amended by a Protocol which was ratified by the four governments in 1964.

At the meeting the Commission reviewed and approved the research and management work done in 1964 on the fur-seal herds of the Commander, Robben, and Pribilof Islands. The seal herds of Robben Island and the Commander Islands continue to show a favorable increase in numbers. The herd on the Pribilof Islands is considered to be nearing optimum size, but uncertainties regarding that conclusion still remain. No further reduction of the female component of the Pribilof herd is planned, but a kill of females limited to the estimated annual surplus will be continued. Efforts are being directed toward refinement of seal population research. The

commercial harvest of seals in 1964 was 18,873 from Robben Island and the Commander Islands and 65,432 from the Pribilof Islands. This compares with 14,656 and 86,246, respectively, taken in 1963.

During 1964, Japanese and Canadian scientists visited the Pribilof Islands to observe and participate in the research work being carried out in the United States.

The Commission has as its major responsibility investigation of the fur seal populations of the North Pacific Ocean and determination of the measures which will make possible the maximum sustained yield from that resource. (Fisheries Attache, United States Embassy, Tokyo, February 19, 1965.)

The Commission is composed of representatives from the member countries. They are William M. Sprules, Special Assistant to the Deputy Minister of Fisheries of Canada; Tomoyoshi Kamenaga, Chief, Production Division, Fisheries Agency of Japan; A. S. Babaev, Chief Specialist, State Committee on Fisheries, U.S.S.R.; and Ralph C. Baker, Assistant Director for Resource Development, U. S. Bureau of Commercial Fisheries, United States. Kamenaga as Chairman of the Commission presided at the meetings. The Commission meeting was preceded by a meeting of the Commission's Standing Scientific Committee which began February 15.

The Soviet Commissioner was elected Chairman of the Commission and the United States Commissioner was elected Vice Chairman. The term of the newly elected officers will extend through the next annual meeting which will be held in Ottawa, Canada, beginning February 21, 1966. The Standing Scientific Committee will meet one week earlier to consider the results of the preceding year's investigations and to prepare its report for the Commission.

Note: See Commercial Fisheries Review, April 1964 p. 48.

GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)

TWENTY-SECOND SESSION MEETS IN GENEVA:

Further reduction of import restrictions was an important item on the agenda of the 22nd Session of the Contracting Parties to the GATT scheduled to meet in Geneva, March 2-26, 1965. The agenda also called for a discussion of trade expansion in the less developed countries.

International (Contd.):

Two countries, Malta and Malawi, have adhered to the GATT since the 21st Session, bringing the total number of contracting parties to 64.

The GATT is the principal international forum in which trade policy problems are discussed and resolved among the world's trading nations. The GATT, whose members are responsible for over 80 percent of world trade, is the multilateral trade agreement which replaced the old bilateral trading system existing prior to World War II. The Kennedy Round negotiations for the lowering of trade barriers is also taking place within the framework of the GATT. (U. S. Department of State, March 1, 1965.)

Note: See Commercial Fisheries Review, May 1964 p. 41.

LAW OF THE SEA

CERTAIN INTERNATIONAL
CONVENTIONS RATIFIED BY
ITALY AND NEW ZEALAND:

On January 18, 1965, New Zealand deposited its ratification of the Convention on the Continental Shelf. The Convention entered into force June 10, 1964.

On December 17, 1964, Italy deposited its accession to the Convention on the Territorial Sea and the Contiguous Zone, and the Convention on the High Seas. Those Conventions entered into force September 10, 1964, and September 30, 1962, respectively.

The Conventions ratified by New Zealand and Italy were formulated at the United Nations Conference on the Law of the Sea at Geneva on April 29, 1958. (Department of State Bulletin, February 22, 1965.)

Note: See Commercial Fisheries Review, Mar. 1965 p. 83; Jan. 1965 p. 59; Dec. 1964 p. 39; Nov. 1964 p. 70; Oct. 1964 p. 49.

UNESCO INTERGOVERNMENTAL
OCEANOGRAPHIC COMMISSIONIOC ESTABLISHES WORKING GROUP
ON MUTUAL ASSISTANCE:

The Intergovernmental Oceanographic Commission (IOC) of UNESCO at its Third Session, which met June 1964 in Paris, passed a resolution recognizing the urgent necessity for mutual assistance between its Member States in developing their national programs in order to study the oceans as a whole more thoroughly. (IOC programs are carried out

through cooperative action by Member States rather than by centralized action.)

At the June 1964 meeting, IOC decided to establish a Working Group on Mutual Assistance to carry out the following tasks, among others: (1) Encourage sister-relationships between universities and government agencies in advanced countries on the one hand and developing countries on the other. (2) Obtain and arrange to report information on the availability of reliable, easily operated, and relatively inexpensive oceanographic instruments; also report on standard methods and procedures. (3) Study and advise on curricula and methods for educating marine scientists and technicians. (4) Help Member States to obtain needed financial and technical assistance for development of marine sciences. (5) Arrange for places on research vessels for the training of marine scientists and technicians of developing countries. (6) Encourage regional collaboration between institutions working in neighboring areas. (Pacific Science Association Information Bulletin, Vol. 16, No. 6, December 1964.)

Note: See Commercial Fisheries Review, July 1964 p. 44.

UNITED NATIONS SPECIAL FUND

DEVELOPMENT PROJECTS TO AID
FISHERIES IN ARGENTINA, GHANA,
PAKISTAN, CENTRAL AMERICA,
AND EAST AFRICA:

The Governing Council of the United Nations Special Fund held its Thirteenth Session in New York City, January 11-18, 1965, and approved five new fishery development projects. The Food and Agriculture Organization will serve as the executing agency for the projects.

The projects may offer an opportunity to United States firms to compete internationally in providing consultative services, or equipment and materials.

Following are summaries of the five fishery development projects approved:

Argentina (SF/R. 10/Addendum 2): Fishery development project: Fund allocation \$1,509,400; recipient government counterpart contribution \$1,572,000; duration 5 years.

Argentina's fisheries landings of a little over 100,000 metric tons a year are thought to be only a fraction of the country's marine potential.

The immediate objectives of the Special Fund project in Argentina are to: (1) conduct an extensive exploratory fishing survey; and (2) provide advisory services to help

International (Contd.):

the Argentine Government and industry overcome institutional and other problems which have been hampering fisheries development.

Purse-seine fishing for anchovy, mackerel, and other pelagic species will be emphasized at the start of exploratory work. The introduction of purse seines may provide an immediate solution to the raw material shortage at Argentine fish meal plants and canneries. Other resources that may be studied by exploratory fishing are shrimp, bottomfish, squid, and octopus. Echo-sounding surveys with vertical and horizontal sonic equipment will be made during exploratory fishing.

For this project, the Special Fund will provide an exploratory fishing vessel equipped with fishing gear; additional research equipment; and an international expert team consisting of two biologists, one or two master fishermen, an economist, and a Project Manager who will be a fisheries industry expert with considerable background in technology. Additional consultative services will be made available to cope with special problems in different fields. Several fellowships for Argentine students will also be provided.

The Argentine Government will provide an exploratory fishing vessel, additional research and support personnel, and maintenance expenses for the project.

Ghana (SF/R.10/Addendum 17): Fishery research unit: Special Fund allocation \$1,413,600; counterpart contribution \$850,000; duration 5 years.

The Special Fund project in Ghana will assist in the development of fisheries through the establishment and operation of a marine research unit. The unit, which will be operated initially by an international team of experts in cooperation with specialists from Ghana, will be concerned mainly with practical problems of application. Emphasis will be on the biological and technological studies required for efficient exploitation of such resources as tropical sardines, horse mackerel, tuna, and some bottomfish species. Oceanographic work of the unit will be limited to relatively simple measurements having direct bearing on the availability, abundance, and distribution of exploitable fish stocks.

In view of the need to study tropical sardines and other resources on a regional basis, consideration will be given during the course of the Ghana project to setting up a regional scheme involving other West African countries.

For the implementation of the Ghana project, the Special Fund will provide laboratory equipment, fishing gear, and other equipment; several student fellowships; and a team of international experts consisting of a Project Manager, several biologists, an oceanographer, two fishing experts, and an economist experienced in practical fishery problems. In addition, consultative services will be made available to cope with special problems.

The Government of Ghana will contribute a professional counterpart staff and clerical services; land and buildings; an experimental fishing vessel; maintenance of the vessel; and miscellaneous services and facilities.

After termination of Special Fund assistance, the Government of Ghana will assume full responsibility to operate the research unit and participate in a regional fishery scheme that might be developed by that time.

Pakistan (SF/R.10/Addendum 40): Survey for the development of fisheries in East Pakistan: Special Fund allocation \$1,505,800; counterpart contribution \$1,145,000; duration 5 years.

The aims of the Pakistan project are to: (1) carry out exploratory fishing trials and biological studies; (2) develop a core of skilled Pakistan fishermen; (3) examine current Pakistan practices of marketing and distribution, and initiate experiments for their improvement; and (4) develop an efficient system of recording fisheries statistics.

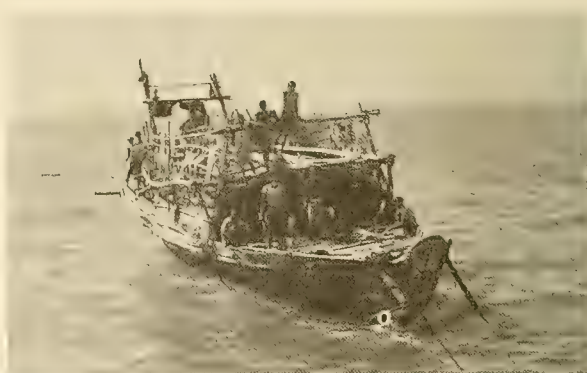


Fig. 1 - East Pakistan stake-net fishing during the winter season in the Bay of Bengal.

Trial fishing will take place mainly in the Bay of Bengal and the lower reaches of the main river systems. Two vessels will be used and a number of different fishing techniques will be tried, including trawling, purse-seining, gill-netting, and long-lining. If the potential of the salt-water fisheries turns out to be limited, the project will concentrate upon the problems of Pakistan's fresh-water fisheries.

For the implementation of this project, the Special Fund will provide an exploratory fishing vessel; fishing gear and other equipment; some land vehicles; and an international team of experts consisting of a Project Manager, two fishery biologists (one of them experienced in hydrography), two master fishermen, a gear technologist, one marketing expert, one statistician, and consultants on special problems. A limited number of fellowships will be given to selected Pakistan members of the counterpart staff to provide training abroad in highly technical fields.

The Pakistan Government will contribute a counterpart staff, an exploratory fishing vessel with crew, shore facilities, some equipment, and all operating and maintenance expenses.

Central America Regional (SF/R.10/Addendum 65)-- Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua: Fishery development project; Special Fund allocation \$1,828,900; counterpart contribution, equivalent of: \$2,170,000; duration 6 years.

International (Contd.):

Fisheries in Central America are concerned mainly with the shrimp and spiny lobster export industry; there are no important fisheries in the region supplying the domestic market. The underdeveloped state of the fisheries is mostly due to lack of experienced fishery administrations in most of the countries concerned, insufficient knowledge of available resources and methods of exploiting them, and lack of modern marketing systems.

The Special Fund fishery development project in Central America will aim at increasing the production and consumption of fish and fishery products on a regional basis. There will be four main fields of activity: (1) strengthening of fishery administrations; (2) development and management of various fisheries; (3) improvement of processing and marketing; and (4) a general resource survey.

An offshore fishing survey will be carried out with a chartered vessel. Fishing survey operations will be mainly in Pacific waters, with particular emphasis on deep-water shrimp stocks and finfish resources on the Continental Shelf. (Pertinent information from the fishing surveys of the Caribbean Fishery Development Project, which is a separate regional scheme supported by the Special Fund, will be made available to the Central American project.)

For the implementation of this project, the Special Fund will provide three medium-to-small vessels and fishing gear; a chartered vessel for an offshore survey; land vehicles and other equipment; several student fellowships; an international team of experts; consultant services; and subcontracts for highly specialized studies.

The contribution of the Central American Governments will include counterpart staff and crew; maintenance expenses; and miscellaneous services and facilities.

Regional--East Africa (SF/R.10/Addendum 69)-- Kenya, Uganda, and the United Republic of Tanzania: Lake Victoria fisheries research; Special Fund allocation \$763,400; counterpart contribution, equivalent of \$580,000; duration 5 years.

The purpose of this Special Fund project is to assist in the development and management of fresh-water fisheries in East Africa through biological investigations and economic surveys. The project is aimed at expanding the activities of the East African Fresh-water Fisheries Research Organization, which has carried out biological research on Lake Victoria and in other areas since 1947. The Organization is jointly supported by the Governments of Kenya, Uganda, and the United Republic of Tanzania.

Exploratory fishing and biological research under the Special Fund project will be concentrated on Lake Victoria. Economic surveys and marketing studies may be spread over a broader area.

To help carry out the project, the Special Fund will recruit a team of international experts, including a biologist, a hydrobiologist, a statistician, a master fisherman, and an economist. The Special Fund will also provide a fully equipped research vessel, some field

and laboratory equipment, and several fellowships for African students.

The East African Governments involved will contribute a counterpart staff, laboratory and shore facilities, and a small fishing vessel. After conclusion of Special Fund support, the African Governments will assume full responsibility for continuing the research programs with their local staff.

It is expected that the results of the studies during and after the period of Special Fund support will speed up investment in the fresh-water fisheries of the region, and make an early contribution towards economic growth in East Africa.



Fig. 2 - In Lake Victoria, Kenya, a floating screen of papyrus rushes (about 200 feet long) is poled out into the lake a short distance from shore. Two ends are drawn together forming a trap out of which surface fish cannot escape.

More detailed summaries of the above projects may be obtained from Trade Opportunities Staff, BDSA-6192, Room 4203, U. S. Department of Commerce, Washington, D.C. 20230. Telephone WO 7-4674 (Area Code 202). Inquiries should contain the project number for the "Summary" desired.

Note: See *Commercial Fisheries Review*, January 1965 p. 60.

SOCIALIST COUNTRIES FISHING VESSEL CONGRESS

HELD AT LENINGRAD:

The 2nd Socialist Countries Fishing Vessel Congress held at Leningrad, Nov. 17-24, 1964, was attended by more than 300 persons from the U.S.S.R., Poland, East Germany, Rumania, Bulgaria, and Hungary. About 220 participants were from the Soviet Union and 36 from Poland. There were no observers or guests. The first Congress was held at Leningrad in 1956; the third is expected to be held before 1969.

Some 59 papers and other communications were discussed at the Conference which was organized in three sections: (1) Fishing techniques and economics, covering the entire field of fishing vessel operations; (2) General operational problems, including unloading at sea, fish processing at sea, etc.; (3) Technical mat-

International (Contd.):

ters, including construction of vessels, engines, etc., application of computers to construction, noise prevention, etc.

Considerable discussion was focused on the desirability of developing single vessels or fleet operations. All agreed fleet operation was necessary in distant waters where shore bases were unavailable. But there was no answer to whether single vessels or fleets were more economical. Fleets were deemed best from the technical standpoint and with regard to quality of fishery products. In the economic considerations there must be included the loss of vessels while unloading at sea and the difficulties encountered when many vessels are fishing in the same area. Unloading at sea has not been solved satisfactorily. There was general discussion on motherships carrying fishing craft on board. That approach is needed for fishing distant waters lacking shore bases. Poland plans to build one or more vessels of that type.

No binding decisions were reached at the Congress. A final protocol was signed but each country was left to draw its own conclusions from the papers presented and the discussions. The protocol covered modern ocean-fishing fleet developments with regard to vessel engines, machine rooms, mechanical processing of fish on board, facilities for locating fish and control of fishing equipment, noise prevention, static balance of vessels, use of computers, exchange of information by Socialist countries. The third Congress to be held prior to 1969 was also covered in the protocol.

The Soviet Union agreed to publish the Conference papers and a summary of the discussions held.



Australia

SPINY LOBSTERS TOO HIGH-PRICED FOR SYDNEY RESTAURANTS:

Lobsters (spiny) were omitted from the menu of most restaurants and night clubs in Sydney, Australia, during the latter part of 1964 because they were too high-priced. According to the president of the Master Fish Merchants Association, it was impossible to sell lobsters even at a small profit to cover

expenses without being accused by customers of "robbing the public."

Night clubs shared part of the blame for prices termed fantastic that were paid for lobsters at the local market auctions. Low-cost meals for club members were said to be subsidized with profits made from gambling machines, and as a result night clubs did not care what they paid for lobsters which was considered unfair competition to other businesses.

The financial position of many retail fish stores in Sydney was described as critical because of the scarcity of fresh fish and the high prices for shrimp and lobsters which made it difficult for some stores to meet overhead expenses. (Australian Fish Trades Review, January 1965.)

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WHALE OIL OUTPUT, 1964:

Australia's output of sperm whale oil in 1964 rose to an estimated 5,160 short tons from 4,551 tons in 1963, even though the number of operating land stations had been reduced from 2 to 1.

Operations in 1964 were restricted to the catching of sperm whales. In 1963, there had been some humpback whaling in Western Australia; however, results were poor with only about 717 tons of oil produced. (Foreign Agriculture, March 29, 1965, U. S. Department of Agriculture.)

Australian whaling operations have declined drastically since the 1959/60 season when over 16,000 tons of whale oil were produced. The decline is due in large part to the scarcity of humpback whales which were once abundant off Australia during their annual migration from the Antarctic to warmer waters for breeding.

By the end of 1962 all whaling stations on the Australian East Coast had closed. The West Coast whaling station at Carnarvon closed in August 1963. That left only the West Coast station at Albany open in 1964.

Note: See Commercial Fisheries Review, Nov. 1963 p. 56 and Aug. 1963 p. 81.



Canada

FISHERIES TRENDS, 1963-64:

Canadian sea fisheries landings (includes Newfoundland and excludes seaweeds) during 1964 totaled 2,221.4 million pounds (valued at C\$132.7 million) as compared with 2,198.4 million pounds (valued at C\$117.1 million) during the same period in 1963, an increase of 1.0 percent in quantity and 13.4 percent in value, according to the December 1964 Monthly Review of Canadian Fisheries Statistics.



Fig. 1 - Off the British Columbia coast, a Canadian purse-seiner is drawing the net tighter around a good catch of herring.



Fig. 2 - Filleting cod at a fish plant in St. John's, Newfoundland.

The landings and ex-vessel values of the principal species were:

Species	Landings		Value	
	Jan.-Dec. 1964	1963	Jan.-Dec. 1964	1963
	. (1,000 Lbs.) .		.. (1,000 C\$) ..	
Atlantic Coast:				
Cod	568,756	609,547	20,680	20,993
Haddock	106,346	90,984	6,224	4,918
Pollock	56,947	56,581	1,831	1,716
Herring	309,982	252,683	3,306	3,087
Swordfish	11,683	14,465	3,494	2,974
Lobsters	41,842	44,375	24,218	21,281
Scallops	16,683	16,219	7,273	6,255
Pacific Coast:				
Halibut	1/35,755	2/37,275	1/8,840	2/8,249
Herring	503,501	572,579	6,146	6,481
Salmon	118,593	119,339	28,841	22,758

1/Including 8,168,000 pounds (C\$2,039,000) landed in U.S.

2/Including 11,341,000 pounds (C\$2,528,000) landed in U.S.

VESSEL INSURANCE UNDER FISHERMEN'S INDEMNITY PLAN:

The Canadian Federal Government has raised the upper limit on vessels which may be insured under the Fishermen's Indemnity Plan to \$15,000. Previously the limit covered only vessels costing up to \$12,500. There is no change in the lower limit of \$250.

Under the Plan, in the event of total loss, insured fishermen are paid an indemnity of 60 percent of the value in the Atlantic provinces and 70 percent in British Columbia. In the event of partial loss, indemnity against the cost of repairing the vessel in excess of 30 percent of the appraised value is paid in Newfoundland, Nova Scotia, and Quebec; 20 percent is paid in New Brunswick and Prince Edward Island, and in excess of 15 percent of the appraised value on the Pacific Coast. (Bulletin of Fisheries Council of Canada, February 1965.)

FISHING VESSEL SUBSIDY INCREASE EMPHASIZES IMPORTANCE OF PACIFIC TRAWLING:

The Canadian Federal subsidy for steel trawlers of over 100 gross tons operating out of Pacific and inland ports was increased from 35 to 50 percent on April 1, 1965. (The 50-percent subsidy rate was already in effect for such steel vessels on the Atlantic Coast.) At the same time the Canadian Federal subsidy for wooden fishing vessels of over 100 gross tons was increased from 35 to 40 percent in all areas.

The Canadian Minister of Fisheries pointed out that the increased emphasis on steel trawlers operating out of Pacific ports arises from the extension of fishing off that coast to more distant waters. The subsidy increase is designed to encourage Canadian fishermen to trawl for the extensive groundfish resources off the Pacific Coast. Heavy catches of cod and other species have been made in those waters by Russian and Japanese fishermen in recent years, the Minister said.

A change in the administration of the Canadian fishing vessel subsidy program also was effective April 1, 1965. The assistance program for wooden fishing vessels of over 100 tons was transferred from the Canadian Department of Transport to the Department of Fisheries. The assistance program for steel trawlers over 100 tons will continue to be handled by the Canadian Maritime Commis-

Canada (Contd.):

sion, Department of Transport. (Canadian Department of Fisheries, Ottawa, March 4, 1965.)

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GOVERNMENT SPONSORS NEW COMMUNITY FISH PROCESSING CENTERS IN NEWFOUNDLAND:

A Canadian program in excess of C\$500,000 to help the Province of Newfoundland provide additional community processing and storage centers for salt fish and collection depots for fresh fish was announced jointly March 8, 1965, by the Federal Fisheries Minister and the Newfoundland Minister of Fisheries. Plans for the new facilities are part of a Federal-Provincial program to accelerate fisheries development in Newfoundland and Labrador.

New community salt fish centers for Newfoundland are to be built at Foxtrap, Conception Bay; Mount Arlington Heights, Placentia Bay; Thornlea and Dildo in Trinity Bay; and Upper Jenkins Cove, Twillingate. The fresh fish collection depots are planned for Plate Cove East, Bonavista Bay; Chance Cove, Trinity Bay; Sagona, Hermitage Bay; Lamaline East on the Burin Peninsula; and Seal Cove, Connaigre Bay. In addition to those new facilities, plans are being made to enlarge the salt fish center at L'Anse au Loup in Labrador.

These community facilities are expected to be completed in 1965. The cost of the buildings, including related marine works, will be borne by the Canadian Federal Government, with the Province undertaking responsibility for making building sites available and assuring normal maintenance and operation. (Canadian Department of Fisheries, Ottawa, March 8, 1965.)

* * * * *

GOVERNMENT RELOCATION PROGRAM FOR NEWFOUNDLAND FISHERMEN:

A Canadian Federal-provincial government program to encourage the relocation of from 4,000 to 5,000 households in many small Newfoundland fishing settlements to more suitable communities within the province was announced jointly in March 1965 by Canada's Federal Government Fisheries Minister and the Minister of Fisheries of Newfoundland.

The program is a long-term plan for the centralization of fishermen in Newfoundland and will affect only those isolated communities in which at least 90 percent of the households agree to move. It will provide for payment of a grant of C\$1,000 to each household, plus \$200 for each member of the household, as well as actual travel and removal expenses for the household and their effects to a designated growth point within the province. The major share of the cost will be borne by the Federal government. The offer of assistance is to be in force for 5 years starting April 1, 1965.

The program is to be carried out gradually, with assistance to the households involved expected to average about \$2,400. The total program will cost several million dollars. A large number of isolated settlements are expected to be abandoned through the resettlement plan during the next 5 years.

While the object of the program is to centralize fishermen, the terms of the plan will apply to all households in a settlement regardless of occupation. Payment of removal expenses and grants to nonfishing households, and fishing households not wanting to continue in fishing, would be for relocation in any approved locations within the province. Those wishing to continue in fishing as an occupation would be eligible only when moving to approved fishing settlements where employment opportunities are offered either afloat or ashore.

For some years past the Government of Newfoundland has provided financial assistance of up to \$600 per household to encourage fishermen to move to more suitable locations within the province, where agreement to move has been reached by all members of the community. Under the program some 90 settlements have been abandoned, while gradual unassisted abandonment of some 60 additional settlements has also taken place. After abandonment of a settlement, the land is to revert to the Crown to prevent year-round resettlement, although seasonal fishing or other operations can be carried out, but with no additional public facilities.

Field administration of the new program is to be the responsibility of the Provincial government. A standing committee with representation from both governments will be appointed to give general supervision to implementation of the program. A study is to be

Canada (Contd.):

made to establish the immediate and long-term absorptive capacity of selected "growth points" and the probable costs of extending existing facilities to meet the needs of a significant increase in population.

The decision of the two governments (Federal and provincial) to speed up the resettlement plan is considered basic to the successful development of the Newfoundland fisheries, and followed submission of a report made by senior Federal and provincial officials who earlier met in St. John's. They included representatives of the Department of Fisheries of Canada, Treasury Board, the federal Departments of Public Works and Labour, the Atlantic Development Board and ARDA. Newfoundland representatives were from the provincial Departments of Fisheries, Public Works, Highways, Municipal Affairs, and Welfare and Economic Development.

The plan stemmed from the realization by both Federal and provincial governments that opportunities for improvement of income and living standards of fishermen would continue to be limited so long as fishermen remained dispersed in several hundred small fishing settlements. Many of those settlements have as few as 10 or 15 households, the fishermen use small boats and are dependent on fish coming close to shore, as well as being handicapped by short fishing seasons, local curing of fish with salt, and restricted market opportunities. (Department of Fisheries, Ottawa, March 5, 1965.)

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DECLINING HARP SEAL HERDS PROTECTED BY ST. LAWRENCE CATCH QUOTA IN 1965:

Harp seal hunters were subject to a Canadian catch quota in the Gulf of St. Lawrence in 1965 for the first time. A catch quota of 50,000 was placed on young seals in District 2, the Gulf's main sealing area, and the killing of old seals in breeding patches was prohibited. The action was based on scientific evidence accumulated over the last 10 to 15 years which indicated that the harp seal herds in the Gulf of St. Lawrence were being reduced by an excessive harvest.

To enforce the quota and other sealing regulations, the Canadian Department of Fisheries stationed fishery officers aboard each

vessel at the hunt as well as at the drop points where planes landed the seal pelts taken. A government helicopter patrolled the seal whelping grounds near Prince Edward Island, the center of sealing operations this year.

The sealing season in the Gulf opened on March 8, 1965, and a strict watch was kept on daily operations. With favorable weather prevailing, it became apparent that the 50,000 quota would be taken very quickly, so the season for taking young seals was closed March 11, 1965.

Canadian Fisheries Department officials in the Maritime Provinces who supervised and carried out the protection program in the Gulf said they considered the operation to have been effective. They were pleased also with the cooperation received from the masters of sealing ships and from aircraft operators who engaged in the hunt.

An overall check on March 12 showed all seal catching operations in the Gulf of St. Lawrence had ended.

Some of the sealine ship masters continued sealing operations in international waters on the "Front," the North Atlantic area off Labrador and the east coast Newfoundland. In that area, the Canadian Department of Fisheries, through its Newfoundland Area headquarters, surveyed the seal fishery with air patrols and also by stationing observers aboard sealing vessels. (Canadian Department of Fisheries, Ottawa, March 16, 1965.)

Seal hunting in the North Atlantic waters of the "Front" is an international operation. The problem of pursuing additional seal conservation measures in that area has been brought before the International Northwest Atlantic Fisheries Commission, which is concerned with the investigation and conservation of the major fisheries in the Northwest Atlantic. Canada hopes that harp and hood seals can be brought within the responsibility of the Commission by a protocol amendment to the Convention under which the Commission operates. A number of countries have already ratified the protocol amendment on harp and hood seals.

Note: See Commercial Fisheries Review, March 1964 p. 45.

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SEALING OPERATIONS IN GULF OF ST. LAWRENCE, 1965:

Invitations were extended by Canada's Fisheries Minister to representatives of three hu-

Canada (Contd.):

mane and conservation societies to view the sealing operations and observe the effectiveness of the new seal protection regulations in the Gulf of St. Lawrence during the week of March 15, 1965. The Ontario Humane Society Canadian Society for the Prevention of Cruelty to Animals, and Canadian Audubon Society sent representatives. Sealing in the Gulf of St. Lawrence area opened on March 8, and on the Front on March 12.

Following serious consideration given to the whole matter of sealing on the Atlantic Coast, the Canadian Fisheries Minister in fall 1964 instituted more restrictive regulations which were to become effective with this year's operations.

In the opinion of experts the method presently used for killing seals, when properly executed, does not subject the animals to undue pain.

In recent years, helicopters have been used in sealing operations. This year, as last, it is unlawful to use a helicopter or other aircraft for sealing except under an aircraft sealing license issued by the Minister. The main commercial sealing operations take place on the Front area, which includes all the waters of the Strait of Belle Isle and the Atlantic Ocean east of a straight line between Amour Point on the coast of Labrador and Flowers Cove, Newfoundland, and in the Gulf area, which includes all the waters and territories west of a straight line between Amour Point on the coast of Labrador and Flowers Cove, Newfoundland.

The Gulf area itself is further divided, for regulation purposes, into three districts. In District 2 of the Gulf an annual quota has been set of 50,000 seals. That district includes all the waters and territories south of 50° N. latitude and west of a line from Cape Ray to Cape North. In District 2, helicopters and other aircraft can be used in sealing under a sealing license issued by the Minister. In the other two Gulf districts, and on the Front area, helicopters and other aircraft may be used from land bases for spotting only. (Canadian Department of Fisheries, Ottawa, February 22, 1965.)

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LARGE STERN TRAWLER FOR NOVA SCOTIA FIRM:



Fig. 1 - The Acadia Albatross, one of Canada's newest and most modern stern trawlers, is an all-welded steel vessel strengthened for navigation in ice. Main specifications are: length overall 152 feet, breadth molded 33 feet, and gross tonnage about 625 tons. The vessel was launched in Lauzon, Quebec, November 23, 1964, for a Nova Scotia fisheries firm.

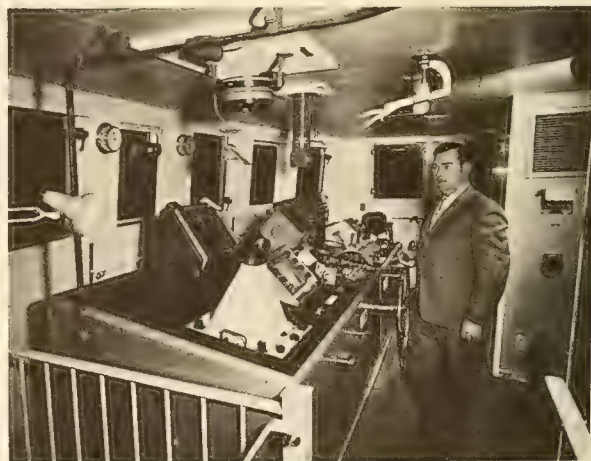


Fig. 2 - The Captain of the Acadia Albatross in the vessel's wheelhouse. In front of the Captain is an instrument console which includes radar, loran, echo-sounders, and radiotelephone. Propulsion is to be marine diesel engine and controllable pitch propeller controlled directly from the wheelhouse.

Note: See Commercial Fisheries Review, March 1965 p. 70.



Ceylon

SCOTTISH GROUP TO HELP DEVELOP FISHERIES:

A group of 100 Scottish firms associated with Scotland's fishing industry has signed a preliminary agreement with the new Fisheries Corporation of Ceylon to provide it with about £30 million (US\$84 million) over 10 years to develop Ceylon's fisheries. The Scottish group will also provide technical equipment and expert guidance, and will help to train the local staff in Ceylon.

The Ceylon corporation, which was established in October 1964, hopes to spend about £115 million (US\$322 million) on fisheries development through similar negotiations with other foreign groups and with its own resources of about £30 million. A French combine is also interested in the project.

Ceylon is about the same size as Ireland in area, has about twice the population, and imports £4 million (US\$11.2 million) worth of fishery products annually. Up to a few years ago, before restrictions were placed on imports, the value was twice that amount.

The preliminary agreement was signed earlier this year by the Ceylon corporation chairman, and by a British Treasury official and representative of the group in Scotland. A final agreement was being prepared for signature sometime in spring 1965. (The Irish Skipper, Dublin, No. 12, January 1965.)



Chile

FISH MEAL INDUSTRY HURT BY ANCHOVETA SHORTAGE:

Anchoveta, the industrial fish of Chile, remained beyond the range of the Chilean purse-seine fleet for most of the last half of 1964. (Chilean purse-seiners have a limited range. The vessels work close to shore off northern Chile where the Continental Shelf is narrow. Also, since the vessels do not usually carry ice, they must deliver anchoveta shortly after they are caught.)

In June 1963 anchoveta practically disappeared from the northern coast of Chile and did not return until December 1963.

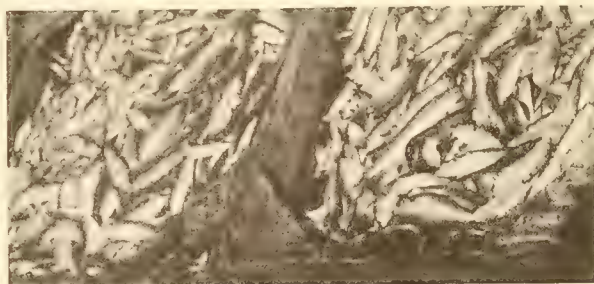
In 1964 anchoveta were caught through the off-season months of June, July, and August, but fishing was erratic and the anchoveta lean. The abundant supply anticipated with the opening of the main fishing season around mid-September 1964 failed to materialize and fishing continued spotty through November. The northern fleet, numbering well over 200 purse-seine vessels, ranged as far south as Mejillones Bay in search of the elusive anchoveta, but without much success. In early December 1964 limited numbers of anchoveta reappeared off the northern coast but the fish were small and had a low oil content. Fishing through January 1965 was also poor.

In early 1965 some 35 fish reduction plants with a combined capacity of almost 1,100 metric tons of raw fish an hour were in production or nearing completion in northern Chile (Tarapaca Province); 18 months earlier there were only 13 fish meal plants in northern Chile and their combined capacity was only about 284 tons of fish an hour. Over the same interval the Chilean anchoveta fleet has tripled its fishing power. Yet during that time the industry has had only 5 months of good fishing. During 1964 it is doubtful that the industry ever operated at maximum capacity. With normal operations, Chilean export earnings in 1964 from fish oil and meal could have reached US\$25 million; actual shipments, however, were valued at slightly less than \$15 million. (United States Embassy, Santiago, February 20, 1965.)

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SARDINE CANNING INDUSTRY:

Chile now has only one plant canning sardines under government sponsorship--it is the Industria Pesquera Cavanchain Iquique. Its entire production is marketed domestically.



Boxes of sardines and anchovies destined for a canning plant in a small fishing village on the Chilean coast.

Chile (Contd.):

The Chilean Government is also financing the construction of a new cannery at the Empresa Pesquera de Tarapaca S. A., also located in Iquique. The new cannery, expected to begin operations in May or June 1965, will include 4 production lines, 1 of which will can Spanish sardines with a capacity of about 300,000 cases a year.

There are also several privately owned firms in Chile which can sardines. (United States Embassy, Santiago, March 9, 1965.)



Denmark

FISHERY LANDINGS, UTILIZATION, AND EXPORTS FOR 1964 AND OUTLOOK FOR 1965:

Landings: Denmark's fishing industry set new records in 1964 with landings of 865,000 metric tons valued at 546 million kroner (US\$79.2 million), an increase of 3 percent in quantity and 15 percent in value over the previous year. Landings of plaice, herring, and salmon were above those in 1963, and pond trout production set a new record.

The value of Danish landings in foreign ports was about the same as in 1963, but that of landings by foreign vessels in Danish ports was higher. The average price per pound for the total 1964 catch was up 10 percent from

the previous year because of higher prices paid for food fish, herring in particular, and industrial fish. The quantity of fish used for processing continued to increase in 1964, especially for herring and plaice fillets.

Disposition of Catch: The Danish Fisheries Minister estimates that about 25-30 percent of Denmark's fishery catch is used for food and 70-75 percent is for industrial use (fish meal and oil, fish and fur-animal feeding, and ensilage). Landings of Norway pout and sand eels all go for industrial use. Also, 80 percent of the 1964 landings of herring and brisling, more than 90 percent of the had-dock landings, and 25 percent of the mackerel landed were for industrial use.



Fig. 1 - Hvide Sande, a small fishing port on Jutland west coast.

Despite the relatively good prices offered in 1964 for iced and boxed drawn haddock, fishermen claimed they could not take the time required for the extra effort in landing haddock as food fish.

Exports: SUMMARY: Denmark's total exports of fishery products and byproducts in 1964 were up 4 percent in quantity and 15 percent in value from 1963, in spite of a substantial decline in shipments to the United States.

Denmark's fishery exports, especially fresh and frozen, would have been still greater in 1964 if additional supplies had been available. Export gains were recorded in all major categories except canned shellfish and

Table 1 - Disposition of Danish 1964 Fishery Landings with Comparisons

Item	1964	1963
	... (Metric Tons) ...	
<u>Processed for consumption:</u>		
Fillets:		
Flatfish	20,000	18,000
Cod & codlike	22,000	20,800
Herring	36,000	28,500
Canned (sterile)	11,000	11,600
Smoked	5,000	4,100
Other	9,000	1/
Total	103,000	1/
<u>Fish meal and oil:</u>		
Fish and fish waste used	2/500,000	2/470,000
Meal produced	112,000	96,000
Oil produced	33,000	28,000
<u>Fish ponds and animal farms:</u>		
Fish and fish waste	130,000-	130,000-
	150,000	150,000
<u>Ensilage:</u>		
Fish and fish waste	7,000	2/6,000
1/Not available.		
2/Estimated.		

Denmark (Contd.):

Table 2 - Danish Fishery Products Exports ^{1/} to all Countries, 1963-1964						
Product	1964			1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000
Fresh, frozen, & cured:						
Fresh fish	199,338	358,722	51,990	200,519	314,100	45,523
Frozen fish	49,579	181,245	26,268	46,538	152,097	22,043
Salted fish	5,890	18,857	2,733	9,945	26,881	3,896
Smoked fish	631	9,170	1,329	517	7,322	1,061
Canned products:						
Fish	6,141	22,556	3,269	5,507	20,474	2,967
Shellfish	1,181	9,676	1,402	1,952	12,738	1,846
Semipreserved products:						
Fish	1,533	9,481	1,374	1,663	9,291	1,346
Shellfish	861	5,845	847	168	2,625	380
Other products:						
Fish meal, fish oil, solubles, ensilage, and trout food . .	109,216	110,228	15,975	93,261	83,979	12,171
Total	374,370	725,780	105,187	360,070	629,507	91,233

^{1/}Includes direct shipments from Greenland and direct landings by Danish vessels in foreign ports.

salted fish. In 1964, exports of fresh and frozen fillets--up 32 and 22 percent, respectively--accounted for 30 percent of all fishery exports by value.

Danish fishery products were exported to 129 countries in 1964.

EXPORTS TO COUNTRY ECONOMIC GROUPS: The European Common Market (EEC) accounted for 42 percent of the value of Danish fishery exports in 1964, and the European Free Trade Association (EFTA) took 37 percent.

West Germany continued as the largest importer, accounting for 27 percent of the value of Denmark's total fishery exports in 1964. The United Kingdom was in second place with 18 percent of the total. The shipments to West Germany consisted mainly of fresh herring, herring fillets, and eels. Exports to the United Kingdom were mainly

fresh flatfish (including direct landings), frozen flatfish fillets, and pond trout. Sweden continued to take substantial amounts of a variety of Danish fish, including salmon, pond trout, plaice and other flatfish, fresh and frozen fillets, and fish offal for Swedish fur-animal farms.

Exports to the East Bloc in 1964 rose 17 percent from the previous year, despite a 7 percent drop in exports to East Germany. Larger fish meal shipments to Poland accounted for most of the increase in shipments to the East Bloc.

Table 3 - Value of Danish Fishery Products Exports by Areas and Major Countries, 1963 and 1964

Destination	1964		1963	
	Kr. 1,000	US\$ 1,000	Kr. 1,000	US\$ 1,000
By areas:				
Common Market (EEC)	306,000	44,350	260,000	37,700
European Free Trade Assn. (EFTA - including Finland)	268,000	38,850	225,000	32,625
East Bloc countries	35,000	5,075	30,000	4,350
Other countries	117,000	16,950	114,500	16,600
Total	726,000	105,225	629,500	91,275
Major importers by country:				
West Germany	196,000	28,400	159,000	23,050
United Kingdom	132,000	19,150	109,000	15,800
Sweden	79,000	11,450	59,000	8,550
Italy	44,000	6,375	39,000	5,650
Switzerland	40,000	5,800	36,000	5,200
United States	33,000	4,775	46,500	6,750

EXPORTS TO THE UNITED STATES: Danish exports of fishery products to the United States in 1964 were down 29 percent in value and 36 percent in quantity from 1963 due mainly to a drop in exports of frozen cod fillets (blocks). Contributing to the drop in cod fillet sales to the United States were (1)



Fig. 2 - A pond trout enterprise in Denmark.

Denmark (Contd.):

a lower catch in Greenland, and (2) strong demand and better prices in England and on the European Continent.

In the face of strong competition in the U. S. market, there were declines in the exports of frozen trout because of imports from Japan, and in canned shrimp because of supplies from U. S. canners and other foreign sources. The only substantial gain in shipments to the United States was in exports of flatfish, accounted for mainly by a sharp rise in sole exports.

landings in Denmark by foreign fishermen and (2) rationing of Danish herring landings.

On March 11, 1965, the Danish Fisheries Minister submitted to the Folketing (Parliament) a proposal which would enable him to establish minimum prices for exports of fish and fishery products after consultation with an Export Committee. The 8-man Export Committee would consist of representatives from all segments of the fishing industry.

The Danish fishing industry is supporting the proposal to regulate minimum export prices. It is thought that competition between

Table 4 - Danish Fishery Products Exports to the United States^{1/}, 1963-1964

Product	1964			1963		
	Quantity	Value		Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000
Fresh & frozen:						
Fillets:						
Cod	4,895	15,336	2,223	8,934	27,919	4,048
Other fillets	678	2,397	348	769	1,283	186
Pond trout	524	3,868	561	784	6,103	885
Flatfish ^{2/}	237	2,103	304	130	726	105
Norway lobster	199	3,930	570	212	4,368	634
Other	2	77	11	13	141	20
Cured products:						
Salted & smoked ^{3/}	81	255	37	105	207	30
Canned products:						
Herring & sprat	572	2,790	404	556	2,977	432
Shrimp	117	1,189	172	175	1,654	240
Mussels	59	367	53	57	350	51
Other	33	208	30	40	227	32
Semipreserved products	15	195	28	20	240	35
Fish solubles	400	382	56	400	344	50
Total exports	7,812	33,097	4,797	12,195	46,539	6,748

^{1/}Does not include shipments to Puerto Rico or to the United States Army in Europe.

^{2/}Mostly turbot, brill, plaice, and sole.

^{3/}Mostly cod, herring, salmon.

Note: Exports shown include direct shipments from Greenland in 1964 as follows: cod fillets 2,618 tons, flatfish fillets 199 tons, other fillets 391 tons, salted cod 25 tons, and halibut 2 tons. Data on direct shipments from Greenland in 1963 are not available.

EXPORTS TO THE U. S. ARMY IN EUROPE: Danish fishery exports to the U. S. Army in Europe in 1964 totaled 93 tons valued at Kr. 721,000 (\$104,000) and consisted mainly of pond trout (69 tons), flatfish fillets (17 tons), and cod fillets (6 tons). Most of the deliveries to the U. S. Army in Europe were intended for resale in post exchanges and commissaries.

OUTLOOK FOR 1965: Danish exporters of fishery products look forward to 1965 with guarded optimism. But they express concern over (1) the possibility of rising prices for raw fish, and (2) increasing competition from large integrated fishery complexes in other countries. Measures are being debated to increase the supply of raw fish. Processors favor (1) relaxation of restrictions on direct

Danish exporters, especially in the Common Market, has caused reactions which could disrupt the trade. It has not been possible to achieve regulation on a voluntary basis. Violations of the proposed minimum price regulation could result in an exporter losing his license to export fish and fishery products for varying periods. The proposed regulation would not apply to Greenland or the Faroe Islands but Greenland products exported from Denmark would be covered. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 10 & 17, 1965.)

Notes: (1) See *Commercial Fisheries Review*, April 1965 p. 66, October 1964 p. 53, and March 1964 p. 50.

(2) For additional details request copy of MNL-5--"Denmark's Fishing Industry, 1964," from: Fishery Market News Service, U. S. Bureau of Commercial Fisheries, Room 510, 1815 N. Fort Myer Drive, Arlington, Va. 22209.



Finland

GOVERNMENT ASSISTANCE FOR FISHING INDUSTRY REQUESTED:

A Finnish committee representing several fishermen's associations as well as fur farmers submitted a report on March 3, 1965, to the Finnish Minister of Agriculture (the Cabinet member responsible for fishing questions) requesting government assistance to promote fishing and the marketing of fishery products in Finland. The committee proposed that a central organization be established to advertise domestic fishery products, and that more money be appropriated for fishing harbors, roads leading to harbors, supports for the transportation of fish, and loans to fishermen. The committee also recommended that fishing gear, landings, and processing equipment be exempt from sales taxes.



Fig. 1 - Selling fish on the Helsinki dock.



Fig. 2 - Finnish fishermen lifting Baltic herring fyke net in the Turku Archipelago area.

Although Finland has a long coastline on the Baltic Sea and many lakes, fishing has never played a very important role in the national economy. Finnish fishermen, for the

most part, have not had the equipment to go beyond the Baltic Sea to more productive areas. Finnish fish consumption, which amounts to about 18 kilograms (40 pounds) annually per capita, has been supplied to an increasing extent by imports, particularly in the cities. Employment in fisheries has dwindled as young people have moved to more lucrative occupations. Between 1953 and 1963 the number of households in Finland which claimed fishing as their main occupation declined from 4,880 to about 3,600. (United States Embassy, Helsinki, March 11, 1965.)



Ghana

NEW NORWEGIAN-BUILT STERN TRAWLER DELIVERED:

A Norwegian-built stern trawler, the Shama, was delivered to Ghana during February 1965. It was the eleventh large trawler acquired by the Government-controlled Ghana Fishing Corporation.

The Shama is the first of 7 trawlers being built in Norway for Ghana under an arrangement planned by the Norwegian Development Assistance which called for Norwegian experts to be sent to that country with the vessels.

All of the 7 vessels have an overall length of 231 feet 7 inches, and will be powered by diesel engines generating 1,960 hp., coupled to reversible propellers. (United States Embassy, Accra, February 21, 1965.)

Note: See Commercial Fisheries Review, August 1964 p. 65, June 1964 p. 52.

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TRAINING PROGRAMS TO PROVIDE OFFICERS FOR NEW FOREIGN-BUILT FISHING VESSELS:

On January 22, 1965, the Governments of Ghana and Norway signed an agreement at Accra providing for the establishment of a center in Ghana to train Ghanaian deck officers and engineers to man Ghana's fishing fleet. Under the terms of the agreement, Norway will provide equipment and training specialists, and Ghana will be responsible for building and furnishing the training center and paying the salaries of the specialists employed in teaching. Estimated total cost of establishing the training centers is £G100,000 (US\$280,000).

Under another training program in Oslo, Norway, 17 Ghanaians are studying and work-

Ghana (Contd.):

ing in Norwegian shipyards in order to qualify as trawler engineers. The Oslo training course began in mid-October 1964.

In addition to 7 stern trawlers from Norway, Ghana has also ordered 10 stern trawlers and 2 fish-carrier vessels from Japan, 6 stern trawlers from Great Britain, and a number of vessels from the Soviet Union. Ghana has technical service agreements with all of those countries calling for help in operating the new vessels initially.

On January 30, 1965, the 244-foot trawler Subin, the 2nd of the 12 vessels ordered in Japan by Ghana, docked in Tema Harbor on its maiden voyage. The vessel, which has a capacity of 700 metric tons of fish, cost about \$1.4 million. Total cost of the 12 vessels ordered from Japan is reported to be about \$15 million. (United States Embassy, Accra, February 7, 1965; World Fishing, October 1964; and other sources.)

Note: See Commercial Fisheries Review, Feb. 1965; p. 60; Jan. 1965 p. 72; Aug. 1964 p. 65.



Iceland

EXPORT STOCKS OF
PRINCIPAL FISHERY PRODUCTS,
DECEMBER 31, 1964:

Iceland's stocks of frozen groundfish (fillets and blocks) for export to the United States totaled 1,327 metric tons as of December 31, 1964. (United States Embassy, Reykjavik, March 16, 1965.)

Icelandic Export Stocks ^{1/} of Principal Fishery Products, December 31, 1964			
Item	Quantity	Value	
		Metric Tons	US\$ 1,000
Groundfish, frozen:			
For export to U. S.	1,327	29.2	678.0
For export to other countries	1,624	28.1	652.5
Stockfish	5,180	145.0	3,366.9
Herring:			
Salted	2/	52.5	1,219.1
Frozen	3/4, 160	3/25.6	594.4
Industrial products:			
Fish meal:			
Herring	16,005	105.6	2,452.0
Other fish meal	1,112	6.8	157.9
Herring oil	27,349	227.0	5,270.9

1/Includes only stocks intended for export.

2/Not available.

3/Includes 467 tons of frozen herring fillets valued at Kr. 4.5 million (US\$104,490).

Note: Icelandic kronur 43.06 equals US\$1.00.

United States imports of frozen groundfish fillets from Iceland in 1964 totaled 17,812 metric tons of groundfish blocks and slabs, 4,669 metric tons of cod fillets, 2,791 metric tons of haddock fillets, and 548 metric tons of ocean perch fillets.

A report in the British Fishing News, January 8, 1965, said that only 30 Icelandic trawlers were operating this year whereas 2 years ago the Icelandic trawler fleet numbered 48. A declining catch rate by Icelandic trawlers was also reported.

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FISHERY LANDINGS BY PRINCIPAL
SPECIES, JANUARY-AUGUST 1964:

Species	January-August	
	1964	1963
	..... (Metric Tons)	
Cod	262,181	211,219
Haddock	36,971	35,064
Saithe	17,917	10,481
Ling	3,635	4,630
Wolfish (catfish)	7,894	12,423
Cusk	2,794	4,922
Ocean perch	20,904	26,005
Halibut	800	832
Herring	350,375	283,784
Shrimp	202	349
Capelin	8,640	1,077
Lobster	2,466	4,615
Other	7,038	5,653
Total	721,817	601,054

Note: Except for herring which are landed round, all fish are drawn weight.

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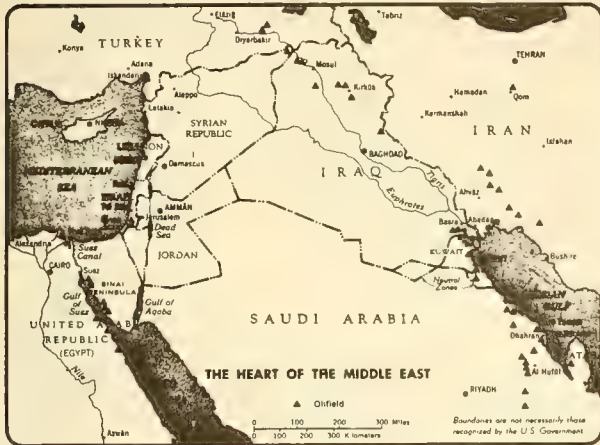
UTILIZATION OF FISHERY LANDINGS,
JANUARY-AUGUST 1964:

How Utilized	January-August	
	1964	1963
	..... (Metric Tons)	
Herring^{1/} for:		
Canning	93	291
Oil and meal	302,897	188,673
Freezing	13,402	21,863
Salting	33,983	67,340
Fresh on ice	-	5,617
Groundfish^{2/} for:		
Fresh on ice	23,748	21,362
Freezing and filleting	158,371	141,785
Salting	84,635	68,355
Stockfish (dried unsalted)	80,667	66,971
Canning	24	35
Oil and meal	2,923	2,811
Capelin for:		
Freezing	133	188
Oil and meal	8,507	889
Shrimp for:		
Freezing	166	267
Canning	36	82
Lobster for:		
Fresh on ice	-	2
Freezing	2,466	4,613
Home consumption	9,766	9,910
Total production	721,817	601,054
1/Whole fish.	2/Drawn fish.	

Iraq

PLANS TO DEVELOP ITS COMMERCIAL FISHERIES:

The Government of Iraq plans to develop its commercial fisheries. Primary emphasis would be on resources in the Persian Gulf, but the possibility of fresh-water commercial fishing would also be explored.



According to the Director of Hydro-biology and Fisheries of Iraq's Ministry of Agriculture, the government will allot ID500,000 (US\$1.4 million) for this fishery project in the next Five Year Plan. It is expected that definite plans for the fisheries project will be formulated after surveys are made.



Italy

EEC SETS ITALIAN DUTY-FREE IMPORT QUOTAS IN 1965 FOR FROZEN TUNA AND SALT COD:

A total of 36,000 metric tons of chilled or frozen tuna destined for the canning industry may enter Italy duty-free in 1965. The quota was set by the Commission for the European Common Market (EEC) and announced by the Italian Minister of Foreign Commerce, December 30, 1964. The EEC also set a 1965 Italian duty-free import quota of 34,000 tons for "merluzzi" (cod) consisting of "stockfish" and "baccala," salted, either in brine or dried, headless or in pieces. (*La Pesca Italiana*, Rome, January 7, 1965.)

TUNA VESSEL LAUNCHED:

In Venice on December 19, 1964, the tuna vessel Albacora was launched for an Italian

firm in Milan. The new vessel of 860 gross tons has these dimensions: length overall 66.6 meters (218 feet), width 10.6 meters (35 feet), depth 5.2 meters (17 feet). It is equipped with a 1,300-hp. engine. (*La Pesca Italiana*, Rome, January 7, 1965.)



Japan

FROZEN TUNA EXPORT TARGETS FOR 1965/66:

At an executive meeting on February 25, 1965, the Japan Export Frozen Tuna Producers Association drafted plans for the business year April 1965-March 1966 for submission to the special general session of the Association on March 8. Reportedly, the Association has set up the following frozen tuna export targets:

1. Direct exports to the United States and Canada: albacore 30,000 short tons; yellowfin 30,000 tons; loins 7,500 tons; and reserve 15,000 tons.

2. Transshipments: Indian Ocean 4,000 short tons (transfer of quota from Japan proper will be recognized); transshipments to Italy 60 percent of the Atlantic tuna fleet's average yearly catch for the past three years, plus 18,000 metric tons to be made available to those who consume their quota; Atlantic Ocean transshipments to the United States, catch of 150 vessel trips (30 additional trips may be supplemented at discretion of executive committee).

3. Exports to overseas bases: 4,000 short tons, plus a supplementary quota of 4,000 tons. (Note: This quota far below actual quantity exported to overseas bases. The Producers Association customarily sets a minimum export target at the beginning of the business year and subsequently increases quota allocation as necessary.)

4. Swordfish exports to the United States: 10 million pounds (8.45 million pounds to be allocated on basis of past performance record, 1.5 million pounds to be made available to firms that have consumed their quota, and reserve quota of 50,000 pounds). (*Suisan Tsushin*, February 26, 1965.)

Japan (Contd.):

EXPORT VALIDATIONS OF FROZEN TUNA AND TUNA LOINS TO UNITED STATES, JANUARY 1965:

Japan's export validations of frozen tuna and frozen tuna loins to the United States in January 1965 totaled 11,391 short tons, an increase of 65 percent compared with 6,903 tons shipped in the same month in 1964. Frozen tuna and tuna loins authorized for shipment direct from Japan in January 1965 were

Japan's Export Validations of Frozen Tuna and Tuna Loins to U. S., January 1965 with Comparisons							
Item	January 1965			January 1964			Total 1964
	Direct	Trans- shipped	Total	Direct	Trans- shipped	Total	
(Short Tons).							
Albacore, round	2,686	5,844	8,530	1,004	2,100	3,104	59,497
Yellowfin:							
Round	-	459	459	-	162	162	-
Gilled & gutted:							
20/100 lbs.	678	182	860	1,393	286	1,679	-
100 lbs. up	112	-	112	373	-	373	-
Dressed with tail	-	378	378	-	547	547	-
Fillets	-	-	-	-	-	-	-
Total	790	1,019	1,809	1,766	995	2,761	38,839
Big-eyed:							
Gilled & gutted	-	-	-	-	-	-	-
Dressed with tail	-	28	28	-	-	-	-
Fillets	-	-	-	-	-	-	-
Total	-	28	28	-	-	-	362
Bluefin, fillets	2	-	2	-	-	-	1
Skipjack, round	-	277	277	5	808	813	3,593
Loins:							
Albacore	645	-	645	155	-	155	3,805
Yellowfin	100	-	100	70	-	70	3,496
Total	745	-	745	225	-	225	7,301
Grand total	4,223	7,168	11,391	3,000	3,903	6,903	109,593

Source: Isaan Frozen Food Exporters Association.

Source: Japan Frozen Food Exporters Association.

41 percent above the quantity exported in January 1964. Authorized transshipments in January 1965 were 84 percent above those in the same month of the previous year. On a species basis, albacore tuna exports were up 175 percent and tuna loins increased 231 percent, but yellowfin and skipjack exports were down 34 percent and 66 percent, respectively. (Fisheries Attache, United States Embassy, Tokyo, February 19, 1965.)

FROZEN TUNA AND SWORDFISH EXPORT QUOTAS:

The Japan Export Frozen Tuna Producers Association, at a special general meeting on March 19, 1965, set the following frozen tuna and swordfish export quotas for the 1965 business year which began in April.

1. United States and Canada--110,000 short tons; all other countries--70,000 metric tons. Allocations will be made on the basis of actual performance in the preceding year.

Thirty percent of the allocations will be offered to the Association, which will be set aside for adjustment purposes (adjustment quota). For market stabilization purposes, during the period April-September 1965, exports will be restricted to not more than 45 percent (49,500 short tons) of the quota to the United States and Canada and 60 percent (42,000 metric tons) of the quota for all other countries. Remaining portions of the quota will be exported during the period October 1965-March 1966.

2. Overseas bases (fresh and frozen tuna): American Samoa--25,000 metric tons; Espiritu Santo, New Hebrides Islands--6,000 tons; Fiji Islands--9,000 tons; Penang, Malaysia--6,000 tons; and St. Martin, Netherlands Antilles--2,000 metric tons.

3. Frozen tuna loins to the United States and Canada--9,000 short tons. Allocations will be made on the basis of export performance record for the preceding three-year period. Twenty percent of the allocations will be offered to the Association for adjustment purposes (adjustment quota).

4. Frozen swordfish exports to North and South America will be limited to 5,500 short tons. Allocations will be made according to the actual performance record for the preceding three-year period. Ten percent of the allocations will be offered to the Association for adjustment purposes (adjustment quota). (Suisan Tsushin, March 20; Suisancho Nippo, March 22, 1965.)

Note: See Commercial Fisheries Review, May 1964 p. 56.

FROZEN TUNA EXPORT PRICE TRENDS:

The market in Italy for Japanese frozen yellowfin tuna in early March 1965 was reported firm. Dressed yellowfin exported to Italy brought US\$435 a metric ton c.i.f., and shipments of mixed yellowfin-albacore \$425 a ton c.i.f.

On the other hand, frozen gilled-and-gutted yellowfin delivered to Puerto Rico were quoted at \$340 a short ton, while yellowfin exported from Japan proper to California were selling at \$345-350 a short ton c. & f.

Beginning March 10 the cost of shipping frozen tuna from Japan to the U. S. west coast was reduced from \$57.75 to \$47.50 per short ton. The reduction in freight cost is said to

Japan (Contd.):

have heightened buying interest in the United States. (Suisan Tsushin, March 11, 1965.)

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EXPORTS OF FISHERY AND AQUATIC PRODUCTS, APRIL 1-SEPTEMBER 30, 1964, WITH COMPARISONS:

The total value of Japan's exports of major fishery and aquatic products in the first six months (April 1- September 30) of the fiscal year beginning April 1, 1964, amounted to US\$143.3 million, an increase of 11.8 percent

canned fishery products 41.5 percent, cultured pearls 18.5 percent, whale oil 3.2 percent, salted and dried products 1.8 percent, and agar-agar 0.8 percent.

Exports of frozen and fresh fishery products during the period increased 85.2 percent in quantity and 47.7 percent in value as compared with the same period in 1963, canned fishery products were up 36.6 and 28.4 percent, cultured pearls 6.5 and 10.8 percent, and salted and dried products 13.9 and 21.1 percent, respectively. But exports of whale oil were down 79.3 percent in quantity and 79.0 percent in value. (Fisheries Attache,

Japan's Exports of Fishery and Aquatic Products, April 1-September 30, 1964 with Comparisons										
Product	Fiscal Year 1964				Fiscal Year 1963				Total	
	Exports		FY 1964		Apr. 1-Sept. 30		Oct. 1-Mar. 31		Actual Exports	
	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value	Qty.	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Frozen Fish & Shellfish:										
Tuna	86,081	31,168	177,804	61,627	62,032	22,251	72,130	27,451	134,162	49,702
Marlin	3,123	1,900	6,800	4,320	2,354	1,596	3,573	2,247	5,927	3,843
Salmon	847	900	1,500	1,940	544	644	599	794	1,143	1,438
Trout (Rainbow)	938	805	1,500	1,415	763	717	692	649	1,455	1,366
Shrimp	529	777	1,500	2,174	499	691	846	1,222	1,345	1,913
Other	71,184	10,741	55,000	13,530	17,029	4,475	32,092	8,099	49,121	12,574
Total frozen	162,702	46,291	244,104	85,006	83,221	30,374	109,932	40,462	193,153	70,836
Tuna, fresh	8,357	2,577	55,500	16,095	9,157	2,706	11,055	3,248	20,212	5,954
Other Products:										
Salted & dried	2,142	2,634	4,200	5,800	1,881	2,175	2,561	3,892	4,442	6,067
Agar-agar	323	1,093	350	1,260	190	664	209	687	399	1,351
Whale oil	23,949	4,609	118,700	24,990	115,562	21,946	108,326	22,963	223,888	44,909
Pearls (cultured)	Lbs. 79,562	26,556	Lbs. 157,073	51,300	Lbs. 74,676	23,976	Lbs. 78,437	26,656	Lbs. 153,113	50,632
Canned Fish:	1,000 Cases		1,000 Cases		1,000 Cases		1,000 Cases		1,000 Cases	
Tuna	3,343	19,127	4,450	37,513	2,130	17,876	1,938	15,990	4,068	33,866
Salmon	568	19,606	1,395	43,962	338	8,051	1,171	39,518	1,509	47,569
Crab meat	245	5,225	438	11,004	225	5,514	249	6,210	474	11,724
Sardines	24	188	100	780	158	1,179	22	184	180	1,363
Saury	504	3,031	1,650	10,680	594	3,697	923	5,858	1,517	9,555
Horse mackerel	415	2,807	600	3,948	251	1,686	178	1,414	429	3,100
Other	1,528	9,553	2,590	17,251	1,155	8,382	1,735	11,053	2,890	19,435
Total canned	6,627	59,537	11,223	125,138	4,851	46,385	6,216	80,227	11,067	126,612
Total value of all products		143,297		309,589		128,226		178,135		306,361

Notes: (1) Value based on f.o.b. prices in Japan.
(2) Latest data are for first six months of fiscal year beginning April 1, 1964.
(3) Actual fiscal year 1963 exports revised.

over the same period in 1963. Frozen and fresh fishery products accounted for 34.1 percent of the total value of the items shown,

United States Embassy, Tokyo, February 17, 1965.)

Note: See Commercial Fisheries Review, August 1964 p. 68.

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Japan (Contd.):

PROGRESS OF NEGOTIATIONS ON CANNED TUNA IN BRINE EXPORTS TO U. S.:

Japanese canned tuna in brine exports to the United States have been suspended since December 1964 as a result of the dispute involving tuna packers and exporters and the failure of the two groups to conclude a new one-year export agreement (old agreement terminated November 1964).

On March 15, the directors of the Japan Tuna Packers Association, following negotiations with the exporters, agreed on a new sales procedure. As a result, hopes were held for an early settlement of the four-month dispute.

Points of agreement reached were: (1) Seventy percent of the total quantity of canned tuna in brine for export will be consigned to the Tokyo Canned Tuna Sales Company (representing packers) for sale to exporters on the basis of their past performance record. (2) Remaining 30 percent will be offered as an adjustment quota under a sales method to be determined by the Packers Association. (3) The period of sales will be determined through mutual consultations between packers and exporters although, as a rule, sales will be conducted on a quarterly basis. Depending on market conditions, sales period may be further divided as in the past.

However, on the same day, despite the accord on sales policy reached between the packers and exporters, the Exporters Association submitted for approval by the Ministry of International Trade and Industry (MITI) a new Exporters Agreement which provided for an 80-percent past-performance quota and a 20-percent adjustment quota. In view of the discrepancy between this provision and the quota allocation agreed to between the packers and exporters, the Packers Association, on March 20, formally requested the Exporters Association to revise the Agreement. According to the Exporters Association, there was insufficient time to incorporate the changes agreed upon but the Association would, in practice, honor the points of agreement reached with the Packers Association.

On March 17, the Japan Export Trade Deliberation Council (highest government-industry advisory group on marine products export) met and approved the enactment of the

"Ministerial Ordinance Related to Restrictions on FY 1965 (April 1965-March 1966) Canned Tuna Sales Procedure" submitted by the Fisheries Agency. Objective of the ordinance is to regulate sales of export canned tuna put up by packers who are not members of the Packers Association. In FY 1964 (April 1964-March 1965) the quantity of tuna packed by nonmember firms reportedly totaled about 91,000 cases.

The new ordinance, if approved by the Government, is scheduled to go into effect April 1. However, in view of the fact that the packers and exporters have not completely reached agreement on the Exporters Agreement, MITI is not expected to immediately act on the ordinance. (Suisan Tsushin, March 23; Suisan Keizai Shimbun, March 18; Nihon Suisan Shimbun, March 17, 1965.)

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RESEARCH VESSEL RETURNS FROM EASTERN PACIFIC TUNA SURVEY:

The Japanese Government research vessel Shoyo Maru (602 gross tons) returned to Tokyo, March 16, 1965, after a 157-day cruise to the eastern Pacific Ocean. The vessel made 27 long-line sets and averaged less than one fish per 100 hooks. The poor results were attributed to low water temperatures and to the vessel fishing in waters outside of the regular tuna fishing grounds.



Shoyo Maru, Japanese Government fishery research vessel.

The vessel also tested the effectiveness of whole saury bait as against half-a-saury bait. On 18 trials, the tuna hook rate for whole bait was 0.4 fish per 100 hooks as compared to 0.38 for half-a-bait. In the case of spearfish, the hook rate was 0.52 versus 0.38. The test indicated that the two types of saury bait did not differ greatly in effectiveness. However the results were held to be inconclusive. Further tests with half-a-saury bait in proven tuna grounds were recommended. The vessel found fairly large concentrations of saury in

Japan (Contd.):

waters not far removed from the tuna fishing grounds. (Suisan Keizai Shimbun, March 19, 1965.)

Note: See Commercial Fisheries Review, November 1964 p. 89.

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TUNA MOTHERSHIP TO BE SENT TO SOUTH PACIFIC:

A large Japanese fishing company planned to dispatch the tuna mothership Yuyo Maru (5,500 gross tons) to the South Pacific on May 8, 1965. The mothership was expected to be accompanied by 55 tuna long-line vessels and to remain on the fishing grounds for about 116 days. The production target is 8,000 metric tons of tuna, spearfish, and shark.

Another Japanese fishery firm, which operates the tuna mothership Nojima Maru (8,800 gross tons), decided not to operate a tuna mothership fleet this year. (Suisan Tsushin, March 22, 1965.)

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PURSE-SEINER TO FISH TUNA OFF GUAM IN NOVEMBER 1965:

A large Japanese fishing company is studying plans to send the 240-ton purse-seiner Kenyo Maru to the waters off Guam in early November 1965 to test fish for skipjack tuna. The Kenyo Maru, which is equipped with a power block, was sent to the New Zealand waters in March 1964 but the trip ended in failure due to the lateness of the tuna season and unfamiliarity with fishing grounds. The vessel, converted into a purse-seiner in 1962, has mainly been employed in the skipjack fishery off northeastern Japan. (Shin Suisan Shimbun Sokuho, March 19, 1965.)

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GOVERNMENT OFFICIAL STRESSES NEED FOR REDUCING TUNA FLEET:

The vice-president of the Japan Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN) met with State Minister Kono on March 19, 1965, to explain the Federation's plan to overcome the stagnant conditions facing the Japanese tuna fishery. The Minister tentatively agreed to NIKKATSUREN's plan, but again emphasized the importance of reducing the size of the tuna fleet. NIKKATSUREN was to meet March 24 to complete

those sections of its stabilization plan dealing with sales expansion and management improvement, but planned to further study the problem of fleet reduction. (Nihon Suisan Shimbun, March 22, 1965.)

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PRELIMINARY PLAN REVEALED TO REDUCE TUNA FISHING EFFORT:

The Japan Federation of Tuna Fishermen's Cooperative (NIKKATSUREN), on February 26, 1965, revealed the general outline of its preliminary master plan to reorganize the Japanese tuna fleet in an effort to overcome the economic difficulties confronting the fishing industry. NIKKATSUREN hopes to confer with the Fisheries Agency over its plan, which calls for reducing the tuna fleet in two phases. In the first phase, holders of tuna fishing rights who lend their rights to others and who do not themselves engage in fishing would be removed from the tuna fishery; vessels transferred from other fisheries to the tuna fishery would be suspended; and commercial fishing by government research vessels would be prohibited and such vessels be made to engage only in research activity for which they were originally intended. In the second phase, a more positive fleet reduction would be effected if the situation warranted such action.



Japanese tuna long-liner leaving Yaizu (principal tuna port) for the Indian Ocean.

NIKKATSUREN's plan also includes the following programs: (1) gear research to develop labor-saving devices which would help solve the labor shortage problem confronting the industry; (2) formation of small-scale fishery operators into corporations to strengthen Japan's competitive position in foreign mar-

Japan (Contd.):

kets; and (3) regulation of production and sales of albacore tuna for export to the United States in order to stabilize prices. (Nihon Suisan Shimbun, March 1; Minato Shimbun, February 27, 1965.)

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EXPORT OF TUNA FISHING VESSELS TO SOUTH KOREA APPROVED BY CABINET:

The sale and export to South Korea of 11 tuna fishing vessels (valued at \$1.4 million) was approved by the Japanese Cabinet on February 9, 1965. Purchase negotiations for the vessels were made in spring 1964, and the vessels completed in summer 1964. The Japanese Government considers that approval for exporting the vessels is an "exception" to the Cabinet order which limits exports of Japanese fishing vessels to Korea to less than 20 tons and with a vessel age of over 5 years. The vessels are 140-ton refrigerated carrier vessels which can also serve as tuna vessels.

South Korean firms are ordering new Japanese "refrigerated vessels" in increasing numbers. In addition to the 11 vessels, several Korean fishing firms have placed orders for a total of 27 such vessels with three Japanese trading firms. (Suisan Keizai Shimbun, February 19; Suisan Shuho, February 25, 1965; United States Embassy, Tokyo, February 6, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 72; September 1964 p. 82.

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ELEVEN LARGE TRAWLERS TO FISH IN GULF OF ALASKA IN 1965:

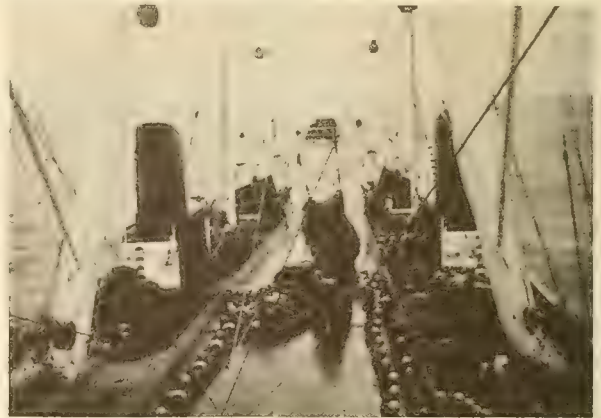
The Japanese Central Fisheries Coordination Council (supreme government-industry fisheries advisory group), at the 49th Session on February 26, 1965, announced its approval of the Fisheries Agency's plan to license in the Gulf of Alaska in 1965 the operation of 11 trawlers and to designate that operation as a licensed fishery. Previously, the Gulf trawl fishery had been designated an experimental fishery.

Gist of the Council's recommendations:

1. Experimental fishing operations conducted since September 1963 in the Gulf of Alaska waters have shown that the area will support a commercial fishery. Thus, trawl

operations in the Gulf of Alaska waters will henceforth be licensed on a commercial basis and a total of 11 large trawlers approved for operation.

2. The operational area in the Gulf of Alaska will include the waters between the meridians 175° W. and 135° W. longitudes north of 50° N. latitude, excluding the Bering Sea.



Aft deck view of Japanese stern trawler which in April 1964 was fishing Pacific ocean perch in Gulf of Alaska.

3. Trawlers between 550-3,500 gross tons will be licensed for operation. They will each be permitted to fish with one small trawler over 200 gross tons but under 550 tons. In the event that they do not directly engage in fishing, they will be permitted to fish with two small trawlers.

4. Licenses will be effective up to January 31, 1966.

5. Halibut, salmon, and king crab will not be taken. Those taken incidentally will be returned to the sea immediately. Catch of herring under 20 centimeters (7.9 inches) must not exceed in numbers 10 percent of the total catch of herring. Should it exceed 10 percent vessels must immediately move away from the area. Marine plants and animals must not be taken in waters within three miles off foreign territory. The possession on board vessels of long lines and gill nets is illegal. The responsible person on board the vessel must report to the government inspector the vessel's daily catch in accordance with provisions to be stipulated separately. (Suisan Keizai Shimbun, February 27; Nihon Suisan Shimbun, March 1, 1965.)

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Japan (Contd.):

FISHERY ACTIVITIES IN
BERING SEA AND NORTH PACIFIC:

The stern trawler Tenyo Maru No. 3 (3,500 gross tons) departed Hakodate, Hokkaido, for the eastern Bering Sea on February 24, 1965. The trawler, which is scheduled to remain on the fishing grounds for about six months, until early August, will replace the stern trawler Taiyo Maru No. 82 (2,890 gross tons) fishing in the Bering Sea as of mid-February. The Taiyo Maru will be diverted to the Gulf of Alaska.

The 1,451-ton trawler Akebono Maru No. 53 was scheduled to depart for the Gulf of Alaska on March 8. That trawler previously operated in the eastern Atlantic Ocean off Africa.

The 14,000-ton fish meal factoryship Hoyo Maru operating in the Okhotsk Sea was scheduled to return to Japan in early April and to depart for the Bering Sea around April 20. The Hoyo Maru, under a special fisheries agreement concluded between Japan and the Soviet Union, is processing into fish meal (production target for 1965--5,000 metric tons) Russian-caught Alaska pollock. The factoryship is fishing with a fleet of 30-40 Russian trawlers.

The king crab factoryship Dainichi Maru (5,859 gross tons) and Tokei Maru (5,835 gross tons), each accompanied by 5 catcher vessels, departed Hakodate on March 1 for

Japanese fish meal factoryship Hoyo Maru.

the eastern Bering Sea. They were expected to arrive on the crab fishing grounds on March 12. The two fleets will experiment with crab pots for the first time this year. The Dainichi Maru is equipped with 150 crab pots and the Tokei Maru 130 pots. They will test the pots, on the average, for a period of about one week per month. (Suisan Keizai Shimbun, February 21, 24, and March 2, 1965.)

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CANNED SHRIMP EXPORTS,
JANUARY-FEBRUARY 1965:

Japan's exports of canned shrimp in January-February 1965 totaled 40,253 cases (converted to 24 1/2-lb. cans), a 14-percent decrease as compared with 59,040 cases shipped in the same period a year earlier. The quantity shipped to the United States was down 21 percent from the same two months in 1964, and that shipped to Great Britain was 7 percent less.

Table 1 - Japan's Exports of Canned Shrimp, by Country of Destination, January 1965

No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases)							
24 1/2-lb.	Small	3,000	150	-	500	155	3,805
24 1/2-lb.	Tiny	2,870	-	-	-	815	3,685
24 1/4-lb.	"	-	2,106	-	400	-	2,506
48 1/4-lb.	"	-	1,019	-	-	-	1,019
24 1/2-lb.	Broken	4,600	-	1,000	-	107	5,707
48 1/4-lb.	"	-	6,551	-	-	-	6,551
24 1/4-lb.	Mixed	-	9,350	-	-	-	9,350
. (No. of Standard Cases of 24 1/2-lb. cans).							
Total 1/Jan. 1965		10,470	13,448	1,000	700	1,077	26,695
Exports Jan. 1964		7,467	12,520	1,720	3,720	1,596	27,023

1/Size of can indicates total weight of contents in can. Totals don't add because of conversion to standard cases.

Source: Japan Canned Crab Sales Co. (Sales agent for canned shrimp.)

Japan (Contd.):

Table 2 - Japan's Exports of Canned Shrimp, by Country of Destination, February 1965							
No. Cans per Case	Size	U. S.	Great Britain	Canada	France	Other Countries	Total
. (No. of Actual Cases)							
24 1/2-lb.	Small	2,500	-	-	250	388	3,138
24 1/4-lb.	"	-	2,000	-	-	-	2,000
24 1/2-lb.	Tiny	400	-	-	-	1,450	1,850
48 1/4-lb.	"	-	1,500	-	-	-	1,500
24 1/2-lb.	Broken	4,750	-	-	-	20	4,770
48 1/4-lb.	"	-	300	-	-	-	300
. (No. of Standard Cases of 24 1/2-lb. cans).							
Total 1/Feb. 1965		7,650	3,800	-	250	1,858	13,558
Exports Feb. 1964		15,570	6,014	6,650	2,450	1,333	32,017

See table 1 for footnotes.

Of the total canned shrimp exports in January, the United States took 39 percent and Great Britain took 50 percent. The remainder went to Canada, France, and other unspecified countries.

Japan's canned shrimp exports in February were down to about one-half of the previous month's. The United States took 56 percent and Great Britain 28 percent of that month's exports. Canada did not receive any Japanese canned shrimp during February 1965. (Fisheries Attache, United States Embassy, Tokyo, March 24, 1965.)

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FISH MEAL IMPORTS AND EXPORTS, 1963-64:

Japan is a net importer of fish meal with imports far in excess of exports. Japanese imports of fish meal in 1964 totaled 102,277 metric tons, an increase of 21 percent from the previous year. Peru and the South Africa Republic were the principal suppliers, accounting for 97 percent of the total in 1964. United States shipments of fish meal to Japan in 1964 totaled 1,429 metric tons with a value of \$187,000.

Japan's exports of fish meal in 1964 amounted to 6,202 tons valued at \$834,000, compared with exports of 3,599 tons valued at \$464,000 in 1963. In 1964, the principal buyers of Japanese fish meal were the Ryukyus, Taiwan, and the Philippines, with combined shipments accounting for 68 percent of the total. In 1963, Taiwan, Hong Kong, and

Japan's Fish Meal Imports, 1963-64				
Country of Origin	1964		1963	
	Quantity	Value	Quantity	Value
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
Peru	83,474	11,128	60,316	7,998
Australia	133	13	379	35
South Africa Rep.	15,741	2,140	18,208	2,363
S.-W. Africa	711	96	1,357	174
Angola	-	-	3,678	459
Communist China	99	15	-	-
Thailand	30	4	-	-
Argentina	126	13	-	-
New Zealand	253	25	254	20
Netherlands	-	-	20	3
United States	1,429	187	101	15
Samoa	281	42	-	-
Total	102,277	13,663	84,313	11,067

Source: Japanese Oils and Fats Import Council.

Singapore were the leading buyers of Japanese fish meal. (Fisheries Attache, United States Embassy, Tokyo, March 5, 1965.)

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JOINT SOVIET-JAPANESE OKHOTSK SEA FISH MEAL OPERATION SUCCESSFUL:

A large Japanese fishing company and the All-Soviet Food Import-Export Corporation concluded an agreement in December 1964 calling for the delivery in February-March 1965 of 30,000 metric tons (with a maximum limit of 36,000 tons) of Russian-caught Okhotsk Sea Alaska pollock to the Japanese firm's 14,000-ton fish meal factoryship Hoyo Maru (formerly Renshin Maru) for processing into 5,000 tons of fish meal. The Hoyo Maru de-

Japan (Contd.):

parted Japan for the Okhotsk Sea in late January to rendezvous with the Russian trawl fleet, which in mid-February was reported to total 30-40 trawlers. The average daily delivery (totaled over 700 metric tons) of Alaska pollock to the factoryship far exceeded expectations, and on March 19 the Hoyo Maru ended operations after exceeding its upper target of 36,000 tons by 300 tons and returned to Hakodate March 23. The factoryship was scheduled to leave for the eastern Bering Sea around April 24.

The newest joint venture with the Soviet Union, which is to run for a period of three years, was a success due to the production target being reached far earlier than expected and the firm price of fish meal in Japan. The factoryship's production was expected to sell for about 64,000 yen (US\$150) a metric ton.

Two other large Japanese fishing companies are reported to have undertaken studies to engage in a similar type of joint operation with the Soviet Union. The two firms are said to be carefully looking into this matter so as to be able to be in a position to most effectively use their factoryships on a year-round basis. Both firms operate fish-meal factoryships in the eastern Bering Sea during the summer season. During the winter season those same vessels (Tenyo Maru 11,581 gross tons, and Soyo Maru 11,192 gross tons, and Gyokuei Maru 10,357 gross tons) are employed as refrigerated carriers in the Antarctic whale fishery. However, the two firms feel that the international whale catch quota may well be greatly reduced this year as a resource conservation measure. In such an event, they will need to reassign some of their vessels now employed in the Antarctic whale fishery. Their plans which are opposed by the Hokkaido trawl fishermen, are said to be looked upon favorably by the Fisheries Agency due to the expanded demand for fish meal in Japan. Also from the standpoint of total Government policy, such a plan, if effected, would help control the outflow of dollars. (Suisan Tsushin, March 15, 17, 20, 23; Suisan Keizai Shimbun, March 14, 1965; and other sources.)

Note: See Commercial Fisheries Review, March 1965 p. 83.

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FISHING VESSEL FLEET STATUS IN 1963 AND CONSTRUCTION TRENDS IN 1964:

Recent fishing vessel construction trends in Japan have been dominated by (1) the ex-

pansion of the trawler fleet, and (2) the increasing importance of fishing vessel exports. On the negative side is the proposal to reduce the number of bonito and tuna vessels in the Japanese fleet.



Fig. 1 - Older type of Japanese trawler operating in the Bering Sea.

Following is a Japanese fishing fleet report published by The Japan Times, March 12, 1965:

Fishing Fleet Status, 1963: Japan's fishing fleet consisted of almost 400,000 vessels with a combined tonnage of about 2 million gross tons as of December 1963, according to the Japanese Fisheries Agency.

About 190,000 marine motor vessels account for the greater part of Japan's fish catch.

Small coastal vessels of under 5 tons make up 87 percent of the total number of vessels. But offshore fishing vessels of over 50 tons account for 67 percent of the fleet's total gross tonnage.

After World War II, which destroyed Japan's fishing fleet, the building of fishing ves-

Japan (Contd.):

Table 1 - Size of Japanese Fishing Fleet, December 1963

Vessel Type	Number of Vessels	Total Gross Tonnage
Ocean vessels:		
With engines	192,515	1,909,522
Without engines	185,196	155,663
Total ocean vessels	377,711	2,065,185
Inland vessels (operating on rivers and lakes):		
With engines	3,600	4,733
Without engines	17,624	8,928
Total inland vessels	21,224	13,661
Grand total	398,935	2,078,846

sels was given priority in order to alleviate the prevailing food shortage.

Japan's basic program to restore its fishing fleet was completed in 1953. Then, the efficiency of the fleet was greatly increased in the 10-year period from 1953 to 1963. The use of diesel engines spread to vessels of all types. Also, there was sharp expansion in the distant-water fleet.



Fig. 2 - Japanese whale catcher in the North Pacific.

Between 1953 and 1963, the number of Japanese offshore fishing vessels of over 500 tons increased from 33 vessels (totaling 109,065 tons) to 240 vessels (totaling 691,042 tons). In 1953, the 500-ton vessel class included only 9 trawlers all of which were under 600 tons. By 1963, there were 39 offshore trawlers with an average tonnage of 1,659 tons. The long-line tuna fleet of 41 vessels (totaling 40,092 tons) in 1963 was non-existent in 1953. The whaling fleet in 1963 included 57 vessels of over 500 tons as compared with only 1 such vessel in 1953.

Fishing Vessel Construction Trends, 1964: Approval of the Japanese Fisheries Agency is required for the construction of any marine fishing vessel of 15 meters (49 feet) or longer. The average Japanese fishing vessel with a 15-meter hull has an approximate gross tonnage of about 15 tons.

Table 2 - Japanese Vessel Construction Permits Issued in 1964

Vessel Classification	Number of Vessels	Total Tonnage
Steel vessels	503	109,503
Wooden vessels	338	13,351
Total	841	122,854

Japanese fishing vessel construction permits issued in 1964 (table 2) indicate a general shift to steel vessels. The catcher vessels carried on motherships used to be made of wood. The last 2 years, a number of those wooden catcher vessels have been replaced with vessels made of steel or light alloys.

Trawler construction is becoming increasingly important in Japan. Japanese shipyards began building large trawlers in the 1950's and by the end of 1964 had launched 18 trawlers in the over 2,000-ton class, 17 trawlers of 1,000-2,000 tons, 8 trawlers in the 1,000-ton class, and a number of smaller trawlers in the 300-1,000 ton class.



Fig. 3 - A 1,000-ton cargo vessel used by Japanese to transport iced fish to Japan. Takes on fish from fishing vessels at sea.

Export orders are increasing at Japanese shipyards. In January 1965, a Japanese shipbuilder launched the first of eight 19,000-ton fish factoryships for the Soviet Union. Japan has also built tuna motherships for the Soviets, trawlers for Rumania and Ghana, and survey ships for Thailand and Indonesia. Japan is building several steel vessels of 100 to 300 tons for countries in southeast Asia. Japanese technicians have also advised on the construction of wooden fishing vessels in a number of developing countries.

Note: See *Commercial Fisheries Review*, Apr. 1965 p. 86; Feb. 1965 p. 60; Dec. 1964 p. 94; Nov. 1964 p. 97; Oct. 1964 p. 57; July 1964 p. 65; May 1964 p. 61.

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Japan (Contd.):

FISHERMEN'S WAGE SCALE:

The Japan Seamen's Union is negotiating a new wage agreement for crew members of tuna fishing vessels belonging to the Nambu Tuna Cooperative Association in northern Japan. Wage scales proposed by the Seamen's Union are:

Base Pay and Bonus Distribution to Crew Members			
Position	Monthly Base Pay		Bonus Percent
	Yen	US\$	
Skipper-fishing captain	44,000	122	2.5
Fishing captain	34,000	94	2.0
Skipper, chief engineer, and chief radio operator	24,000	67	1.5-1.6
First mate, first engineer, deck chief, refrigeration chief, & chief cook	18,000	50	1.2-1.3
Second mate, second engineer, and assistant refrigeration chief	17,500	49	1.1-1.2
Deck workers, engine crew, and cooks	15,000	42	1.0

Table for Computing Bonus for 90- to 100-day Trip			
Vessel Size Gross Tonnage	Value of Landings		Bonus Percent
	Million Yen	US\$1,000	
Under 100 tons	7-8	19-22	3.6
" " "	8-9	22-25	5.8
" " "	Over 15	Over 41	16.1
180 tons	10-12	28-33	6.0
" "	15	41	10.4
240 tons	15	41	10.0

In addition, the Union's proposal includes provisions for pay and allowances for crew members on shipboard duty or on shore leave, pay for crews in reserve status and those on standby status at their homes, and compensation for duty-connected as well as nonduty-connected deaths.

Japanese fishermen engaged in the bottom long-line sea bream fishery in the South Pacific off New Zealand are paid a guaranteed minimum wage ranging from 42,000 to 60,000 yen (US\$117-167) a month, depending on catch and trip length. Fishermen sailing on vessels with catch targets of 300 metric tons of sea bream are guaranteed a minimum monthly wage of 50,000 yen (\$139) if trips are completed within 90 days and 42,000 yen (\$117) for trips up to 120 days. Those sailing on vessels operating under a catch share system whereby landings (after deducting operating expenses) are shared between management and crew at the ratio of 60:40, are guaranteed a minimum wage of 60,000 yen (\$167) if the value of one share falls below that amount.

Shares allotted to crew members of vessels operating under this system are: fishing captain--2.0; skiff captain--1.1-1.2; and skiff crew--1.0. (Suisan Keizai Shimbun, February 12; Minato Shimbun, February 4, 1965.)

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**FISHERY WHITE PAPER
ISSUED BY GOVERNMENT:**

The Japanese Cabinet approved on February 12, 1965, the Fishery White Paper prepared by Japan's Ministry of Agriculture-Forestry. The report revealed that Japan's fishery production during fiscal year 1963 (April 1, 1963-March 31, 1964) totaled 6,700,000 tons, a decrease of 2.5 percent from the preceding fiscal year. But there was an increase of 13.2 percent in value US\$1,342 million) because prices rose 17 percent.

In order to meet growing demand with short supplies, Japan imported 490,000 tons of ma-



Fishermen are hauling yellowtail into fishing boats. Fishing for that species begins in winter on the Kumanonada fishing grounds.

Japan (Contd.):

rine products valued at \$60 million, or more than double the imports for the previous fiscal year. Exports of marine products declined 10 percent to about \$283 million.

The number of fishermen in Japan, which has been decreasing in recent years, dropped further to 626,000 as compared with 667,000 in fiscal year 1962. The departure of fishermen from sea coast villages for more lucrative urban jobs has been the principle cause of this decline, the paper points out.

The number of fishing enterprises also decreased 2.5 percent in fiscal year 1963 down to a total of 221,000. The decrease was mostly confined to small enterprises, but medium-scale enterprises showed an increase.

The sharp rise in prices of fish boosted fishermen's incomes by 15 to 25 percent while income from cultivating pearls and other marine life nearly doubled. The labor shortage in the fishing industry resulted in a 25-percent increase in wages, but they were still considerably lower than those paid to urban factory workers.

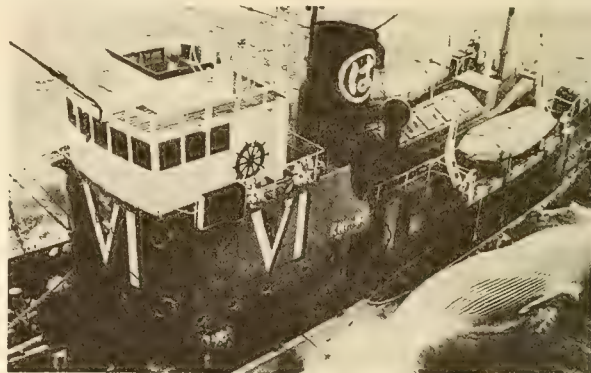
The white paper concludes that Japan's fishing industry needs to make further efforts for conservation and development of marine resources, enhancement of fishing productivity, and modernization of fishing operations. (Japan Report, Consulate General of Japan, New York, N.Y., February 15, 1965.)

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ANTARCTIC WHALE CATCH FOR 1964/65 SEASON AS OF MARCH 1, 1965:

Japan's 7 whaling fleets operating in the 19th international Antarctic Whaling Expedition of the 1964/65 season harvested the equivalent of 3,453.2 blue-whale units as of March 1, 1965, or 83 percent of the Japanese 4,160 blue-whale unit quota for the season. The full blue-whale unit quota was expected to be met by April 20.

valent of 3,453.2 blue-whale units as of March 1, 1965, or 83 percent of the Japanese 4,160 blue-whale unit quota for the season. The full blue-whale unit quota was expected to be met by April 20.



Japanese whaling catcher boat towing a whale.

During the 1963/64 season, the Japanese Antarctic whaling fleets caught 5,722 fin whales and 1,522 sei whales by February 15, 1964. (Suisan Tshushin, March 4, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 74; May 1964 p. 62.

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WHALE CATCH FROM COASTAL AREAS, 1964:

Japan's whale catch from coastal areas by five fishery firms in 1964 was up 7 percent from the previous year's catch. Sperm whales accounted for 64 percent of the total whale catch, the same as in 1963. Despite the high-

Japanese Coastal Whale Catch and Oil Production, 1963-64

Year	Catch						Oil Production		
	Fin	Blue	Sei	Hump-back	Sperm	Total	Blue	Sperm	Total
	(No. of Whales)						(Metric Tons)		
1964	7	120	875	1	1,800	2,803	1,663	6,050	7,713
1963	2	67	855	3	1,694	2,621	1,775	6,502	8,277

Source: Japan Aquatic Oil Association.

er 1964 catch, whale oil production was 7 percent below the 1963 oil yield. (Fisheries Attache, United States Embassy, Tokyo, March 5, 1965.)



Japanese 1964/65 Antarctic Whale Catch as of March 1, 1965

Fleet	Fin	Sei	Catch	Target Catch
	(No. of Whales)		(Blue-Whale Units)	
Kyokuyo Maru No. 2.	570	1,220	488.4	638
Kyokuyo Maru No. 3.	502	1,553	509.8	638
Nisshin Maru	640	1,319	539.8	630
Nisshin Maru No. 2 .	748	1,115	559.8	600
Zunan Maru . . .	752	722	496.4	622
Zunan Maru No. 2 . .	393	1,515	449.0	622
Total	3,605	7,444	3,043.2	3,750
Nisshin Maru ^{1/} . . .	420	1,200	410.0	410
Grand total . . .	4,025	8,644	3,453.2	4,160

^{1/}Quota attained February 28.

Republic of Korea

FIRST TUNA FISHING VESSEL UNDER FRENCH-ITALIAN CONTRACT:

The first tuna fishing vessel (under a contract calling for a total of 99 vessels of various types to be supplied to Korea by a French-Italian consortium) was to be delivered in early March 1965 to the Korea Marine Industry Development Corporation. The vessel will sail to an area near Samoa for tuna fishing.

Some 40 fishing vessels are scheduled to be delivered to Korea by the consortium by the end of 1965. (United States Embassy, Seoul, March 9, 1965.)

Note: See *Commercial Fisheries Review*, December 1964 p. 105.



Morocco

CANNED FISH SALES TO CUBA INCREASE:

Morocco's 1964/65 fishing season (June 1-May 31) started off well and compared favorably with the previous season when a record was established for fishery exports. For the first 5 months of the current fishing season (June-October 1964), exports of Moroccan canned fish were up slightly over the same period of the 1963/64 season. Sardines are by far Morocco's leading fishery export, but a large tuna catch resulted in a 20-percent increase in exports of canned tuna through October 1964.



France has been a major importer of Moroccan fishery products but two major shifts have occurred in Morocco's marketing pattern. Sales to the sterling zone are off sharply since shipments to Ghana, a major importer of Moroccan sardines, are down presumably as a result of competition from the developing West African fishing industry.

The more important change in the marketing pattern for Moroccan fishery products is in sales to Cuba. In the period of June-October of the 1964/65 fishing season Morocco shipped to Cuba 347,755 cases of canned fish, mainly sardines, as compared with only 143,655 cases for the entire 1963/64 season. (United States Embassy, Rabat, February 12, 1965.)



Norway

WINTER HERRING AND COD FISHERIES, EARLY MARCH 1965:

Winter Herring: The cooperative Norwegian Herring Sales Organization reports that some 2 million hectoliters (186,000 metric tons) of winter herring had been landed in Norway as of March 8, 1965, compared to 1.6 million hectoliters (148,800 tons) at the same time last year. With better weather conditions, the catch might have been at least 4 million hectoliters (372,000 tons). Almost 1.7 million hectoliters (158,100 tons) of the 1965 catch have gone to herring meal and oil plants--an increase of 52 percent over last year, while the catch is up only 35 percent.

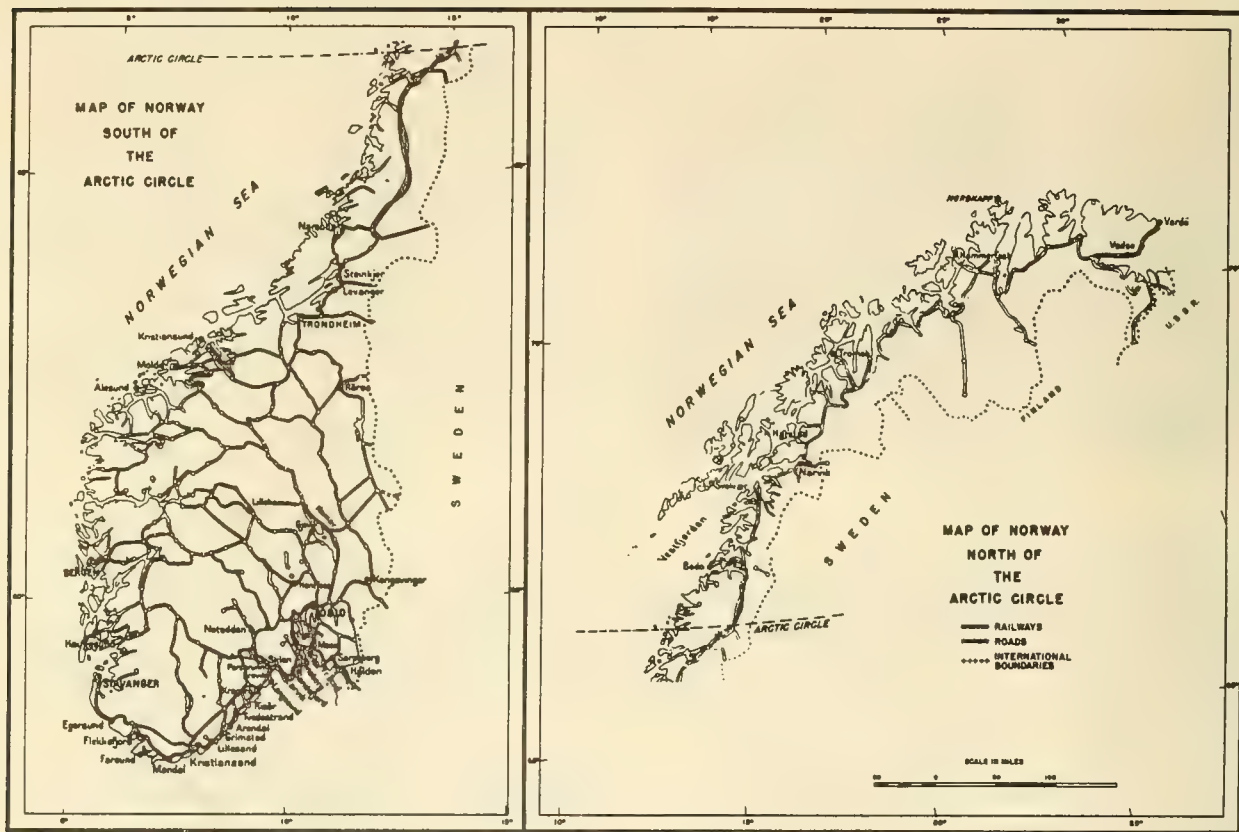
North Norway reported a disappointing winter herring catch of only 640,000 hectoliters (59,520 tons) as of early March.

Cod: The Lofoten cod fishery, also in North Norway, has been plagued by stormy weather, causing heavy damage to fishing gear. As of early March 1965, the Lofoten cod catch totaled 7,074 metric tons.

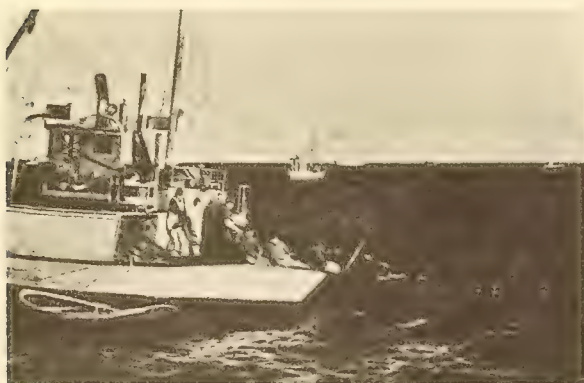
According to a Norwegian oceanographer, it is doubtful whether mature Arctic cod will follow their traditional route to the Vestfjorden spawning banks. They seem quite content to gorge on herring in the waters around Skomvaer and Røst. And, judging from all indications, the cod are likely to spawn in those waters.

Only 5,067 fishermen, manning 1,617 vessels, were participating in this year's Lofoten

Norway (Contd.):



fisheries. Unless there was a notable improvement in the catch, many were expected to leave.



Norwegian vessel fishing cod in Lofoten area.

The Norwegian Fisheries Minister has expressed grave concern about the future of the Lofoten cod fishery which, until a few years

ago, afforded good earnings for up to 25,000 North Norway fishermen. At a press conference in Oslo, March 12, the Norwegian Minister declared that overfishing of Arctic cod in the Barents Sea, by trawlers from most European countries, had reached alarming proportions.

Soviet-Norwegian Talks on Arctic Cod:

The Soviet Fisheries Minister visited Norway in March 1965 and discussed the Arctic cod resource with Norwegian fishery experts. Reporting on those discussions, the Norwegian Fisheries Minister said measures suggested to maintain Arctic cod stocks included regulations to control fishing, and a mandatory increase of the mesh used in trawls, nets, and other fishing gear.

Fisheries Expansion: A Norwegian scientist has urged radical changes in Norwegian fishing methods. He said that the only way to build up a profitable Norwegian fish-processing industry is to supplement the traditional

Norway (Contd.):

coastal fisheries with offshore fishing. This would require a fleet of large freezer trawlers which could exploit the most productive fishing grounds on a year-round basis. The development of deep-sea fishing, based on freezer trawlers, would also help to make the coastal fisheries more profitable, he declared. (News of Norway, March 18, 1965.)

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FIRST WEEK OF WINTER HERRING SEASON YIELDS EXCELLENT CATCHES:

A total of 150,000 metric tons of winter herring was landed in the first week of Norway's winter herring fishing season. This compared with 40,000 tons in the same period of the 1964 season. About 120,000 tons of the new season catch went to the fish oil and meal industry.

Predictions made by the Norwegian Fish Research Organization for the 1965 winter herring fisheries have so far been very accurate. Extensive shoals of herring approached the Norwegian coast at the time and at the points expected (the Kristiansund area and the Lofoten area). For the whole winter herring season the catch was originally forecast at 400,000 tons, or 25 percent more than in 1964. From the results of the first week of fishing, that estimate may be on the low side unless weather conditions cut down fishing. (United States Embassy, Oslo, March 1, 1965.)

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EXPORT VALUE OF FISHERY PRODUCTS AND BYPRODUCTS AT RECORD HIGH IN 1964:

The value of Norwegian exports of fishery products in 1964 was at a record 1,094 million kroner (US\$154 million), an increase of 10 percent from the previous year although the quantity exported was less, according to a report from Norway's Central Bureau of Statistics.

There were considerable shifts in the quantity distribution among the various groups of products, which reflected the varying yields of Norway's different fisheries. The large catches of herring in the North Sea and in Northern Norway resulted in an increase of 78 percent in quantity and 86.7 percent in value for exports of herring meal. There was

a similar increase in quantity and value for exports of fish meal processed from other species of fish.



Fig. 1 - The harbor in Bergen, one of Norway's important fishing ports.

The 1964 exports of other herring products were below the previous year indicating Norway's difficulty in holding on to traditional markets for fresh and salted herring. This may be partly explained by the failure for several years in succession to fill orders received in advance. But herring catches were then small and the demand could not be met.

The lower 1964 Norwegian exports of stockfish and klipfish were attributed to marketing difficulties. Exports of stockfish in 1964 totaled 23,431 metric tons, a decrease of 21.6 percent, while exports of klipfish dropped by 13.2 percent to 26,484 tons.



Fig. 2 - Klipfish carefully stacked for drying in the sun.

The most significant development in Norway's export trade has been the virtually complete collapse in the sale of Norwegian products to the Brazilian market. Despite protests from the Norwegian authorities against what they consider discrimination against Norwegian products in favor of Dan-

Norway (Contd.):

ish exports, it has not been possible to reach a solution.

The difficulties started in the late 1950's when Norway followed a request from the United Nations Economic Council and the World Bank and relinquished its bilateral trade agreement with Brazil to use a clearing basis for further trade with the country. Denmark did not take the same action and continued to trade with Brazil on a barter basis. As economic difficulties in Brazil increased and the reserves of foreign exchange dwindled, Norwegian products were included in the gradually tightening restrictions placed on the use of foreign currency for imports. Meanwhile, Danish exports were able to continue fairly steady because of the bilateral trade agreement. During 1964 this led to a virtual stop in Norwegian exports to Brazil, and although diplomatic negotiations with Brazilian authorities showed some promise, that problem has not yet been solved.

Norway's 1964 exports under the product group "fresh, frozen, salted or smoked fish, crustacea and molluscs" valued at 645.5 million kroner (\$90 million) decreased 2.2 percent. In this case the decrease resulted from the failure of the cod fisheries at Lofoten and on the coast of Finnmark. This was serious enough to offset the 1964 record catch of coal-fish.

The lack of raw materials is also the reason why the substantial expansion for exports of frozen fillets of the previous several years did not continue in 1964. The volume of exports did increase by 3.8 percent, but that increase was considered negligible compared to the almost explosive developments in that industry. In 1963, exports of frozen fillets increased 20 percent from the previous year. That segment of the fisheries industry has become increasingly important to the entire Norwegian economy, and particularly to the economy of northern Norway. Along the coast of that Arctic part of the country the fisheries are by far the most important source of income with many towns and towns built around the only factory there--the fish-freezer plant.

The development of Norway's frozen fish industry is considered particularly important, with the availability of raw materials the only

limitation for further expansion in that field. (The Export Council of Norway, Oslo.)

* * * * *

EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-SEPTEMBER 1964:

Norway's leading canned fish export items in January-September 1964 were smoked small sild in oil and smoked brisling in oil.

Table 1 - Norwegian Exports of Canned Fishery Products by Type, January-September 1964

Products	January-September 1964		
	Quantity	Value	
		Kr. 1,000	US\$ 1,000
Smoked brisling in oil	4, 119	27, 455	3, 834
Smoked brisling in tomato	840	4, 580	640
Smoked small sild in oil	7, 468	31, 464	4, 394
Smoked small sild in tomato	1, 654	5, 813	812
Unsmoked small sild in oil	279	948	132
Small sild packed otherwise	318	1, 155	161
Kipperd herring (Kippers)	2, 462	10, 772	1, 505
Mackerel	541	2, 495	349
Roe, unclassified	1, 117	4, 607	643
Soft herring roe	1, 073	5, 271	736
Fish balls	392	1, 010	141
Other canned fish	73	523	73
Shellfish	1, 247	12, 889	1, 800
Total	21, 583	108, 982	15, 220

Table 2 - Norwegian Exports of Canned Fishery Products^{1/} by Country of Destination, January-September 1964

Country of Destination	January-September 1964		
	Quantity	Value	
		Kr. 1,000	US\$ 1,000
Finland	206	1, 079	151
Sweden	627	2, 867	400
Belgium-Luxembourg	500	2, 403	336
Ireland	226	892	125
France	208	835	117
Netherlands	134	483	67
United Kingdom	5, 182	24, 767	3, 459
West Germany	569	2, 123	296
Czechoslovakia	1, 089	3, 870	540
South Africa Republic	1, 347	5, 357	748
Iraq	74	280	39
Japan	10	48	7
Canada	635	3, 912	546
United States	7, 106	38, 352	5, 356
Australia	1, 232	5, 102	713
New Zealand	363	1, 570	219
Other countries	1, 420	5, 274	737
Total ^{2/}	20, 928	99, 214	13, 856

^{1/}Does not include exports of canned shellfish.

^{2/}Totals are slightly larger than the combined exports of canned fish (excluding shellfish) shown in table 1.

Note: Norwegian kroner 7.16 equals US\$1.00.

The United States and the United Kingdom were the leading buyers of Norwegian canned fishery products. (Norwegian Cannery Export Journal, January 1965.)

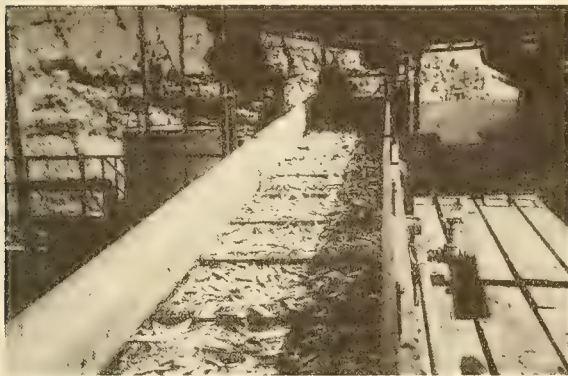
Note: See Commercial Fisheries Review, Feb. 1965 p. 76.



Peru

FISH MEAL PRODUCTION IN 1965 MAY BE CURTAILED BY CONSERVATION MEASURES AND LABOR DISPUTE:

The Peruvian Government, with the support of the fish reduction industry, has decreed that the month of August 1965 will be closed to anchoveta fishing along the entire coast. Government officials and the industry apparently agree with the conclusion of the Peruvian Marine Institute that a reduction in fishing pressure is necessary to sustain an adequate brood stock.



Anchovetas being transported into plant by conveyor belt at Chimbote.

The Institute is uncertain whether the reduced supply of anchoveta is a result of oceanographic and biological factors, or is due to overfishing. But the Institute concludes, in a recently published report, that the industry's installed fish-catching and meal-producing capacity is greater than can be sustained by the present level of anchoveta stocks. Under the circumstances, the Institute believes that fishing pressure should be limited so that the total anchoveta catch does not go beyond that of 1964 and should preferably be closer to that of 1963 when about 7 million metric tons of raw fish were taken.

Closing the fishery during the seasonably slow month of August is not likely to cut total output more than 3 or 4 percent. The real significance of the regulation lies in the fact that the Government and the industry have accepted the need for some action to conserve the anchoveta resource.

(Editor's Note: Of more immediate impact is the decline in output caused by the labor dispute in northern Peru during February 1965. A report in Oil World Weekly,

February 19, 1965, stated that Peruvian fish meal production in February 1965 might amount to only 60,000 to 80,000 metric tons, as compared with 125,000 tons in the same month of 1964.)

Peruvian fish meal production for 1965 cannot be accurately predicted at this point. It is expected, however, that output in Peru this year will at least match 1963 output of 1 million tons but a repeat of the 1964 performance, when over 1.5 million ton of meal were produced, is unlikely. (United States Embassy, Lima, Feb. 28 1965.)



Poland

NORTH SEA 1964 HERRING SEASON PROFITABLE:

Poland's 1964 herring fishing season in the North Sea grounds was considered exceptionally good. Daily catches were as high as 54 metric tons per vessel. (Polish Maritime News, No. 75, November 1964.)

* * * * *

TRAWLER FISHES GEORGES BANK FOR HAKE:

A Polish freezer trawler fished Georges Bank in the Northwest Atlantic for the first time in October 1964 when operations were confined to fishing for hake. The crew was assisted by fishermen from Soviet vessels who were acquainted with the area and showed the Polish fishermen how to operate their trawls. (Polish Maritime News, No. 75, November 1964.)

* * * * *

NORTH SEA AND NORTHWEST ATLANTIC FISHERIES, 1964:

As of mid-October 1964, a 40 vessel fishing fleet out of Gdynia, operating in the North Sea and Northwest Atlantic, caught a total of 64,000 metric tons of fish. This compares with 53,000 tons caught by the same fleet during all of 1963.

Polish freezer trawlers fishing on the Newfoundland and Labrador grounds call at the Port of Ostend, Belgium, on their return trip and sell part of their frozen cod fillets there. (Polish Maritime News, No. 75, November 1964.)

* * * * *

Poland (Contd.):

POLISH FISH-FREEZING BASE
ESTABLISHED AT OSTEND (BELGIUM):

A seasonal land base to freeze fresh herring landed by Polish trawlers was established at the Port of Ostend, Belgium, in late 1964. It was expected that by the end of 1964, about 400 metric tons of herring from the North Sea would be frozen there. The frozen herring when returned to Poland was to be used for canning. (Polish Maritime News, No. 75, November 1964.)

* * * * *

THREE NEW FISHERY
MOTHERSHIPS TO BE BUILT:

A contract for building 3 new motherships for Polish fishing fleets was negotiated in September 1964, between a Gdansk shipyard and the Polish organization "Deep-Sea Fishing Motherships" of Szczecin. The contract calls for the first vessel to be delivered in 1966, the second in 1967, and the third in 1970. They will be of the B-67 class, with the keel of the first vessel scheduled to be laid in April 1965.

Motherships built for Polish fishing fleets will be of the same basic dimensions as those built for the Soviet fisheries--9,200 tons deadweight, 13,600 gross tons, overall length of more than 538 feet, and draft of 25.6 feet. They will be propelled by 7,200 hp. engines for a speed of 15.5 knots, and will be adapted to requirements of the Polish fisheries. Equipment aboard the vessels will include 5 processing lines for preparing fish for freezing, for producing fish meal, cod-liver oil, and icemaking.

Plans are for the new motherships to operate in fishing grounds in the Central and North Atlantic, areas not previously fished by Polish vessels. (Polish Maritime News, No. 75, November 1964.)



Portugal

NEW LISBON FISH MARKET:

February 1965 marked the opening of an auction center at Lisbon's new dockside fish market. Total cost of the entire Lisbon fish market complex when completed will be about US\$7.7 million.

The market will cover an area of some 15,000 square meters (17,940 square yards), almost half of which will be used for the unloading, sale, and distribution of fish. The new market will have the capacity to handle a daily volume of 600 metric tons of fish which is more than double the largest catches heretofore delivered to Lisbon. Under construction at the new market are a freezing and cold-storage plant, administration buildings, pier improvements, and a fuel supply area. (United States Embassy, Lisbon, February 13, 1965.)



Sierra Leone

TERRITORIAL WATERS
EXTENDED TO 12 MILES:

Effective January 14, 1965, Sierra Leone on the West African coast extended her territorial waters to 12 nautical miles measured from the low-water mark of the Sierra Leone coast. The claim to extended territorial waters was stated in "An Act to Amend the Fisheries Act" passed by the Sierra Leone House of Representatives November 27, 1964, and published in the Supplement to the Sierra Leone Gazette, Vol. XCVI, No. 4, January 14, 1965. (United States Embassy, Freetown, March 4, 1965.)



Somali Republic

JOINT UNITED STATES-SOMALI
FISHERIES VENTURE EXTENDED
RISK AND EQUITY GUARANTY BY AID:

A loan of about \$600,000 to the joint United States-Somali fishery firm in the Somali Republic, approved by the U. S. Agency for International Development (AID) in late 1964, is the first direct AID loan made to a private borrower in the country. AID also issued to the company the first extended risk guaranty to be provided outside Latin America, and the first equity guaranty to be issued anywhere.

The investment guaranty, under AID's extended risk program, insures the company for 50 percent of the equity investment of the United States firm against any risks, not to exceed \$111,161. The loan is repayable in United States dollars within 15 years, including a three-year grace period.

Somali Republic (Contd.):

The loan will finance purchases of United States equipment needed to build the first fish-freezing plant in the Somali Republic (near Alula at Ros Filuch). Most of the fishery products processed at the plant will be marketed in Italy through a New York fishery marketing firm.

The United States-affiliated company will benefit from the Development Loan Section services set up with AID assistance in Credito Somalo, an autonomous bank of the Somali Government. Credito Somalo has loaned the company \$500,000, using a portion of an earlier United States loan to the bank to help provide risk capital for private business in the Somali Republic. The United States counterpart of the jointly-owned firm has contributed \$222,322 in equity and the Somali partners were to contribute an equal amount in Somali shillings. Financing, including the equity, the Credito Somalo loan, and the AID loan, total the equivalent of \$1.5 million.

AID has provided technical assistance to the Somali fishing industry and promoted a joint United States-Somali fishing venture for a number of years. Credito Somalo also has helped in the promotion, assisted by United States technical advisors made available by AID. (International Commerce, vol. 71, no. 11, March 15, 1965.)

Note: See Commercial Fisheries Review, January 1965 p. 86.

**South Africa Republic****PELAGIC SHOAL FISH CATCH, JANUARY-OCTOBER 1964:**

The combined pelagic shoal fish catch in the South Africa Republic and Territory of South-West Africa in January-October 1964 totaled a record 1,143,265 short tons (consisting of pilchards, maasbanker, mackerel, and anchovy).

South Africa Republic: In October 1964, a catch of 27,235 tons of anchovy (the best in any single month since the commercial anchovy fishery was started in April 1964) raised the total catch for that species to 78,318 tons and the total catch for all pelagic shoal fish off the Cape in January-October 1964 to 440,398 tons.

South-West Africa: The October 1964 shoal fish catch for the few factories still to reach their quotas at Walvis Bay and Luderitz was 41,820 tons. This brought the total South-West African pelagic shoal catch in January-October 1964 to 702,867 tons. (South African Shipping News and Fishing Industry Review, December 1964.)

**Sweden****PACKAGED FROZEN FISH MARKET TRENDS:**

Fish is the most popular packaged frozen food product sold in Sweden, and on a per capita basis the Swedes are the leading European consumers of packaged frozen food.

Swedish consumption of packaged frozen fishery products amounted to 10,543 metric tons in 1962 and 11,980 metric tons in 1963, most of which was cod. Sales of frozen cod on the Swedish market in 1963 amounted to about 8,000 tons and accounted for almost 20 percent of overall packaged frozen food sales in Sweden. Imports--mostly from Norway and Denmark--probably accounted for about half of the frozen cod sales in Sweden in 1963.

In Sweden, consumer packs of raw frozen fish fillets are usually marketed in packages of 1-pound or 10-ounce size (approximately); institutional packs range up to 10 pounds.

Although cod products are dominant, a wide variety of other packaged frozen fishery products are sold in Sweden; at least 20 different species are marketed and over 100 different packs are offered. Freeze-dried shrimp are now being produced by one Swedish firm on a small scale, according to reports.

Precooked frozen fish is of growing importance in Sweden both as an individual item and as an element in precooked dinners. Cod is the principal species used in precooked dishes such as baked fish and potatoes, minced fish fingers, and rissoles. Haddock is used for precooked fish balls and fish soufflé.

The fast-growing Swedish market for frozen food products of all kinds should continue to expand for a number of years. (The Swedish per capita consumption of packaged frozen

Sweden (Contd.):

food products is still only about 27 percent of that in the United States.) Consumption of packaged frozen fishery products should increase in Sweden, but--since frozen fish is already in a dominant position--the future emphasis in the Swedish market may be on developing other frozen food products.

Sweden imposes an import duty of about 9 U. S. cents a kilo (about 4.1 cents a pound) on frozen fish from countries outside the European Free Trade Association (EFTA). The frozen fish import duty is reduced by 50 percent on shipments from EFTA countries. Sweden also imposes a "price regulation" tax of 3 percent of the purchase value on all imported fishery products. The "price regulation" tax is thought to apply regardless of the country of origin. (Foreign Trade, Canadian Department of Trade and Commerce, March 20, 1965.)

Note: See Commercial Fisheries Review, February 1964 p. 81.



United Kingdom

DEMAND INCREASES FOR FROZEN FISHERY PRODUCTS:

Frozen fish production in Great Britain in 1963 increased only 1 percent from the previous year as against a 17-percent increase in demand. But for the first time the production of consumer-packaged frozen fishery products in 1963 exceeded production of institutional-packed fish. The consumer demand for frozen fishery products in Great Britain continues strong and frozen fish production is expected to increase. This is especially evident as more of the large British freezer



Fish frozen at sea in blocks of 100 pounds are thawed out in a thawing plant at Grimsby prior to filleting.

trawler-owned groups enter the market with their own brands.

The trend toward freezing fish at sea has raised some speculation about the future of the major British trawling ports of Hull, Grimsby, and Fleetwood. It was questioned whether those ports can handle the influx of frozen fish landed with the facilities they now have. Another question was whether dock workers could adapt to the completely different methods required for unloading frozen fish as compared with the more suitable dock facilities at commercial ports such as Southampton. (United States Embassy, London, March 11, 1965.)

* * * * *

TRADE WITH UNITED STATES IN FISHERY PRODUCTS, 1963:

Total United Kingdom purchases of fishery products from the United States in 1963 amounted to 4,200 long tons as compared with 17,500 tons in 1962. The value dropped by US\$616,000 to \$6.7 million. But more salmon (fresh, chilled, and frozen) was purchased from the United States during the year, accounting for a 500-percent increase over 1962.

The potential market in the United Kingdom for fishery products from the United States is limited to specialty items such as salmon and freeze-dried shrimp. Supplies in the United Kingdom of live eels have been short in recent months and British firms have looked to United States producers for supplies. (United States Embassy, London, March 11, 1965.)

* * * * *

FISH MEAL PRODUCTION, 1964:

Fish meal production in the United Kingdom in 1964 totaled 78,000 long tons compared with 74,000 tons in 1963, according to the British Ministry of Agriculture, Fisheries, and Food. Fish meal in the United Kingdom is produced from groundfish and herring. (Foreign Agriculture, March 8, 1965, U. S. Department of Agriculture.)

* * * * *

IMPORT SURCHARGE ON INDUSTRIAL GOODS REDUCED:

The British Chancellor of the Exchequer announced February 22, 1965, that the British Government would cut the temporary import ad valorem surcharge on industrial goods to

United Kingdom (Contd.):

10 percent as of April 26, 1965. A rate of 15 percent had been in effect since the temporary surcharge was established October 27, 1964.

Announcing the reduction to the British House of Commons, the Chancellor of the Exchequer said, "We have now decided that enough progress is being made to enable us to reduce the charge after it has been in operation for 6 months..." The Chancellor said that the remaining 10 percent will be kept "under review." (EFTA Reporter, February 22, 1965.)

(Editor's Note: Fish and fish preparations are exempt from the import surcharge. Also excluded from the surcharge are fishing vessels of 80 gross tons or more and fishing vessels of the kind commonly known as Danish-type seiners.)

Note: See Commercial Fisheries Review, January 1965 p. 95.

* * * * *

FREEZER-TRAWLER "CAPE KENNEDY" ENTERS SERVICE:

The Cape Kennedy, a 227-foot stern trawler designed to freeze fish at sea, entered service in March 1965 for a large British fishing company, joining her sistership, the Ross Valiant, which began operating in the summer of 1964.

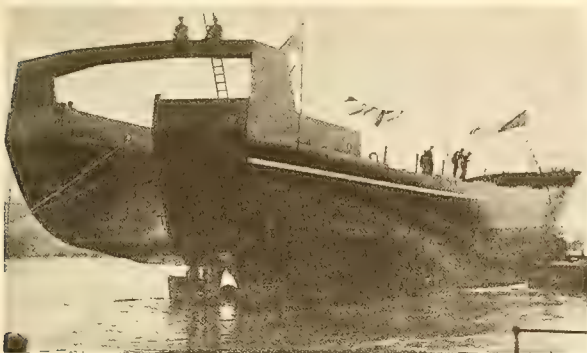


Fig. 1 - Stern view of Cape Kennedy showing stern ramp. Taken after launching in 1964.

Like her sistership, the Cape Kennedy will carry a crew of 26 and have a storage capacity for about 400 tons of frozen fish. However, to increase efficiency, some changes were made in the Cape Kennedy, including modifications in unloading equipment.

Fish-processing machinery is housed between decks on the Cape Kennedy while the engines and main tanks are below the lower deck.

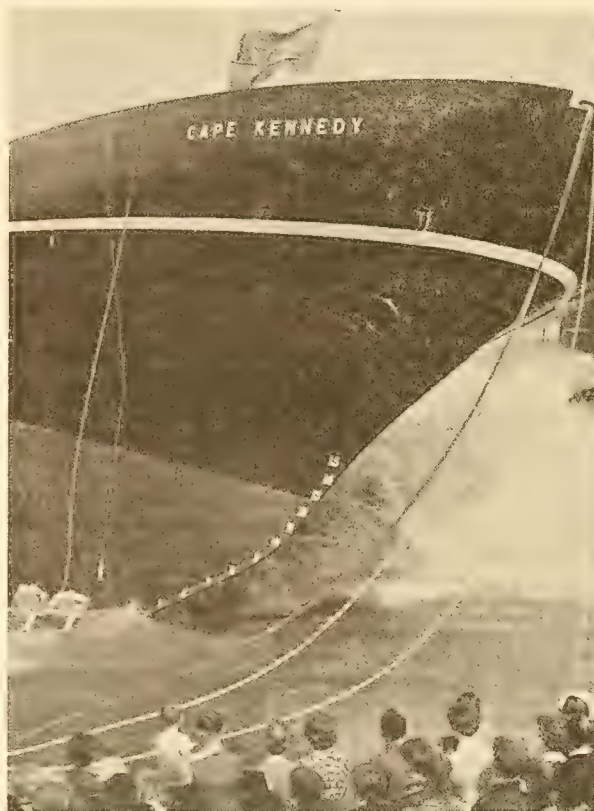


Fig. 2 - Bow view of Cape Kennedy during launching ceremony in 1964.

Two tall gantries which span the vessel are used to work the fishing gear. The mid-ship gantry is used for handling the net on the upper deck, while the after one at the head of the stern ramp lifts the cod end and spills the catch through a hatch to the fish-processing deck below.

After gutting and washing, the fish are taken by conveyor belts to plate freezers where they are frozen into 100-pound blocks. (The vessel is equipped with 10 plate freezers, each of which can freeze about $3\frac{1}{2}$ tons of fish a day.) After freezing, the fish blocks are "posted" through slots in the deck to the fish room below which can be maintained at -20°F .

The British firm operating the Cape Kennedy and Ross Valiant has reported plans to

United Kingdom (Contd.):

order a number of other freezer-stern trawlers as replacements for its fleet of distant-water trawlers. For the near- and middle-distance British fisheries, the same firm is pioneering the use of smaller semiautomated trawlers (with 5- and 10-men crews). Those smaller stern trawlers make shorter trips and store their catch in ice.

Note: See Commercial Fisheries Review, March 1965 p. 94; Sept. 1964 p. 98; July 1964 p. 79, April 1964 p. 76; and Sept. 1963 p. 92.



Yemen

FISHERIES TRENDS, 1964:

Change may soon come to the modest fisheries of Yemen, which borders on the Red Sea and has access to the Indian Ocean. The development of Yemen's fisheries is one of the stated objectives of Soviet assistance to Ye-

men. (A Soviet-Yemen loan agreement for 65 million rubles was announced in March 1964.) The assistance program may provide a Soviet-built fish processing and freezing plant in Hodeida, the leading fishing port of Yemen. That project coupled with the acquisition of several modern fishing vessels could revolutionize the traditional fisheries of Yemen.

Meanwhile, there was little change during 1964 in the actual operation of Yemen's rather primitive fisheries. The demand for fish in the coastal area continued to support a fleet of small fishing boats. There were about 1,000 fishermen in Hodeida, which was more than in all the other fishing ports combined. Fish preservation was mainly limited to drying and most of the catch was sold in coastal ports, with only a small portion going to the inland area to Aden. (United States Embassy, Taiz, March 10, 1965.)

Note: See Commercial Fisheries Review, Dec. 1961 p. 91.



TUNA RECIPE FOR TEEN-AGE COOKS

The Tuna Research Foundation has come up with a grand recipe for the teen-age cook. It features canned tuna in zingy individual spaghetti casseroles that are a snap to fix.

Even a beginning teen cook can fix up these casseroles. Convenient canned tuna needs no more than a twist of the can opener and it's ready to go. Packaged spaghetti dinner provides the other half of the casserole recipe. Chopped olives add a touch of contrasting color.


Keep the ingredients for Tuna Teen Casseroles on your pantry shelf and the recipe tacked up on the door. Then, if you're delayed while shopping, daughter (or son) can save the day at home.

TEEN'S TUNA CASSEROLE


1 package complete spaghetti dinner with mushrooms
(package thin spaghetti, can tomato and mushroom sauce, can grated cheese)

1 can (6 $\frac{1}{2}$ or 7 ounces) tuna in vegetable oil
 $\frac{1}{2}$ cup chopped pimiento stuffed olives

Cook spaghetti according to package directions. Drain. Open can of spaghetti sauce with mushrooms; add tuna with oil, and chopped olives. Add to drained spaghetti and mix well. Divide among 4 individual casserole dishes. Open can of grated cheese and sprinkle over top of each casserole. Bake in 375° F. oven 15 minutes. Makes 4 servings.



FEDERAL ACTIONS



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

INDUSTRIAL AND COMMERCIAL LOANS TO FISHERIES FIRMS AS OF JUNE 30, 1964:

Following is a summary of industrial and commercial loans to fisheries firms by the Area Redevelopment Administration (ARA) as of June 30, 1964:

Firm	Location	Main Products or Services	ARA Assistance
Alaska Ice & Storage	Kodiak, Alaska	Crab and shrimp	\$260,000
Northwest Oyster Farms	Nahcotta, Wash.	Oysters	110,000
Florida Seafood Canning	Apalachicola, Fla.	Fish	756,294
Farwest Fisheries	Anacortes, Wash.	Tuna	355,000
Chesapeake Clam Chip	Cambridge, Md.	Clam chips	213,200
Callao Foods	Callao, Va.	Canned herring, roe, catfood	29,900
Custom Pet Food Packers	Princess Anne, Md.	Pet food	461,500
Alvine's Marine Repair	Kodiak, Alaska	Vessel repair	86,665
Woods Hawkeye Lodge	Compti, La.	Fishing resort	48,750

Note: ARA industrial loans to fisheries firms approved after June 30, 1964, include a \$654,576 loan to help Peter Pan Caribe, Inc., establish a tuna processing, canning, and distribution facility in Ponce, Puerto Rico (announced August 17, 1964); and a \$130,000 loan to help Peninsula Processing Company, Inc., establish a plant in the Sturgeon Bay, Wis., area to process trash fish into meal, solubles, and oil (announced August 19, 1964).

In addition to benefits from ARA industrial loans, the United States fishing industry has also been aided by a number of ARA technical assistance studies and public facilities grants. (More Jobs Where Most Needed, Annual Report of the ARA, 1964.)



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

DEFINITIONS AND STANDARDS OF IDENTITY FOR FROZEN BREADED SHRIMP:

An order establishing definitions and standards of identity for frozen raw breaded shrimp

and frozen raw lightly breaded shrimp (as an addition to Title 21, Code of Federal Regulations, Part 36) was published in the Federal Register, March 5, 1965, by the U. S. Food and Drug Administration. (The order results in the adoption of proposed findings of fact, conclusions, and a tentative order published in the Federal Register, December 22, 1964.)

Effective date for the order establishing definitions and standards of identity for fro-

zen raw breaded shrimp and frozen raw lightly breaded shrimp is June 3, 1965, with one single exception (the exception concerns labeling requirements for optional ingredients used in batter and breading).

The order states that "frozen raw breaded shrimp" shall contain not less than 50 percent shrimp material, and "frozen raw lightly breaded shrimp" shall contain not less than 65 percent shrimp material.

The term "shrimp" is said to mean the tail portion of properly prepared shrimp of commercial species. The optional forms of shrimp which may be processed in the breaded and lightly breaded categories are: (1) fantail or butterfly; (2) butterfly, tail off; (3) round; (4) round, tail off; (5) pieces; and (6) composite units. Detailed specifications for each optional

form are included in the standard. Batter and breading ingredients are also defined.

The labeling requirements of the standards of identity state that the label shall name the food, as prepared from each of the optional forms of shrimp specified. (For example, "Breaded fantail shrimp," "Breaded butterfly shrimp, tail off," etc.) The word "prawns" may be added in parentheses immediately after the word "shrimp" if the shrimp are of large size. If the shrimp are from a single geographic area the adjectival designation of that area may appear as part of the name; for example, "Breaded Alaskan shrimp sticks."

The labeling requirements state that the optional ingredients used in batter and breading (as specified in the standard of identity) "shall be listed on the principal display panel or panels of the label with such prominence and conspicuousness as to render them likely to be read and understood by the ordinary individual under customary conditions of purchase" An exception from the general effective date is provided for the labeling requirements covering optional ingredients in batter and breading. The order states: "Subject to the condition that the labels used name the optional ingredients, the provision in Sec. 36.30(f) requiring that these names are to be listed on the principal display panel or panels shall not become effective until December 31, 1965."

Title 21—FOOD AND DRUGS

Chapter I—Food and Drug Administration, Department of Health, Education, and Welfare

SUBCHAPTER B—FOOD AND FOOD PRODUCTS

[Docket No. FDC-73]

PART 36—SHELLFISH

Frozen Raw Breaded and Lightly Breaded Shrimp; Definitions and Standards of Identity

§ 36.30 Frozen raw breaded shrimp; identity; label statement of optional ingredients.

(a) Frozen raw breaded shrimp is the food prepared by coating one of the optional forms of shrimp specified in paragraph (c) of this section with safe and suitable batter and breading ingredients as provided in paragraph (d) of this section. The food is frozen.

(b) The food tests not less than 50 percent of shrimp material as determined by the method prescribed in paragraph (g) of this section, except that if the shrimp are composite units the method prescribed in paragraph (h) of this section is used.

(c) The term "shrimp" means the tail portion of properly prepared shrimp of commercial species. Except for com-

posite units, each shrimp unit is individually coated. The optional forms of shrimp are:

(1) Fantail or butterfly: Prepared by splitting the shrimp; the shrimp are peeled, except that tail fins remain attached and the shell segment immediately adjacent to the tail fins may be left attached.

(2) Butterfly, tail off: Prepared by splitting the shrimp; tail fins and all shell segments are removed.

(3) Round: Round shrimp, not split; the shrimp are peeled, except that tail fins remain attached and the shell segment immediately adjacent to the tail fins may be left attached.

(4) Round, tail off: Round shrimp, not split; tail fins and all shell segments are removed.

(5) Pieces: Each unit consists of a piece or a part of a shrimp; tail fins and all shell segments are removed.

(6) Composite units: Each unit consists of two or more whole shrimp or pieces of shrimp, or both, formed and pressed into composite units prior to coating; tail fins and all shell segments are removed; large composite units, prior to coating, may be cut into smaller units.

(d) The batter and breading ingredients referred to in paragraph (a) of this section are the fluid constituents and the solid constituents of the coating around the shrimp. These ingredients consist of suitable substances which are

The standards of identity define methods of determining the percentage of shrimp material in breaded shrimp. The method provided to determine the shrimp content of composite breaded shrimp products (shrimp "logs" or "sticks," for example) is the same as that prescribed in the United States Standards for Grades of Frozen Raw Breaded Fish Portions (50 CFR 266.21 f) published by the U. S. Bureau of Commercial Fisheries. That method provides no correction factor, i.e., the product must contain the required amount of shrimp.

For breaded shrimp products other than composite forms, the Food and Drug Administration prescribes a separate method of determining shrimp content which allows a correction factor of 2 percent.

(The United States Standards for Grades of Frozen Raw Breaded Shrimp issued by the U. S. Bureau of Commercial Fisheries are being revised to reflect the Food and Drug Administration provisions in their standards of identity.)

Following is the order establishing definitions and standards of identity for frozen raw breaded shrimp and frozen raw lightly breaded shrimp as published in the Federal Register, March 5, 1965:

not food additives as defined in section 201(s) of the Federal Food, Drug, and Cosmetic Act; or if they are food additives as so defined, they are used in conformity with regulations established pursuant to section 409 of the act. Batter and breading ingredients that perform a useful function are regarded as suitable, except that artificial flavorings, artificial sweeteners, artificial colors, and chemical preservatives, other than those provided for in this paragraph, are not suitable ingredients of frozen raw breaded shrimp. Chemical preservatives that are suitable are:

(1) Ascorbic acid, which may be used in a quantity sufficient to retard development of dark spots on the shrimp; and

(2) The antioxidant preservatives listed in § 121.101(d)(2) of this chapter that may be used to retard development of rancidity of the fat content of the food, in amounts within the limits prescribed by that section.

(e) The label shall name the food, as prepared from each of the optional forms of shrimp specified in paragraph (c) (1) to (6), inclusive, of this section, and following the numbered sequence of such subparagraph, as follows:

(1) "Breaded fantail shrimp." The word "butterfly" may be used in lieu of "fantail" in the name.

(2) "Breaded butterfly shrimp, tail off."

- (3) "Breaded round shrimp."
- (4) "Breaded round shrimp, tail off."
- (5) "Breaded shrimp pieces."
- (6) Composite units:

(i) If the composite units are in a shape similar to that of breaded fish sticks the name is "Breaded shrimp sticks"; if they are in the shape of meat cutlets, the name is "Breaded shrimp cutlets."

(ii) If prepared in a shape other than that of sticks or cutlets, the name is "Breaded shrimp _____," the blank to be filled in with the word or phrase that accurately describes the shape, but which is not misleading.

In the case of the names specified in subparagraphs (1) through (5) of this paragraph, the words in each name may be arranged in any order, provided they are so arranged as to be accurately descriptive of the food. The word "prawns" may be added in parentheses immediately after the word "shrimp" in the name of the food if the shrimp are of large size; for example, "Fantail breaded shrimp (prawns)." If the shrimp are from a single geographic area, the adjectival designation of that area may appear as part of the name; for example, "Breaded Alaskan shrimp sticks."

(f) The names of the optional ingredients used, as provided for in paragraph (d) of this section, shall be listed on the principal display panel or panels of the label with such prominence and conspicuousness as to render them likely to be read and understood by the ordinary individual under customary conditions of purchase. If a spice that also imparts color is used, it shall be designated as "spice and coloring," unless the spice is designated by its specific name. If ascorbic acid is used to retard development of dark spots on the shrimp, it shall be designated as "Ascorbic acid added as a preservative" or "Ascorbic acid added to retard discoloration of shrimp." If any other antioxidant preservative, as provided in paragraph (d) of this section, is used, such preservative shall be designated by its common name followed by the statement "Added as a preservative."

(g) The method for determining percentage of shrimp material for those forms specified in paragraph (c) (1) through (5) of this section is as follows:

(i) *Equipment needed.* (1) Two-gallon container, approximately 9 inches in diameter.

(ii) Two-vented wooden paddle, each vane measuring approximately 1 3/4 inches by 3 3/4 inches.

(iii) Stirring device capable of rotating the wooden paddle at 120 r.p.m.

(iv) Balance accurate to 0.01 ounce (or 0.1 gram).

(v) U.S. Standard sieve No. 20, 12-inch diameter.¹

¹ The sieves shall comply with the specifications for wire cloth and sieve frames in "Standard Specifications for Sieves," published March 1, 1940, in L.C. 584 of the U.S. Department of Commerce, National Bureau of Standards.

(vi) U.S. Standard sieve, 1/2-inch sieve opening, 12-inch diameter.¹

(vii) Forceps, blunt points.

(viii) Shallow baking pans.

(ix) Rubber-tipped glass stirring rod.

(2) *Procedure.* (i) Weigh the sample to be debreaded. Fill the container three-fourths full of water at 70° F.-80° F. Suspend the paddle in the container, leaving a clearance of at least 5 inches below the paddle vanes, and adjust speed to 120 r.p.m. Add shrimp and stir for 10 minutes. Stack the sieves, the 1/2-inch mesh over the No. 20, and pour the contents of the container onto them. Set the sieves under a faucet, preferably with spray attached, and rinse shrimp with no rubbing of flesh, being careful to keep all rinsings over the sieves and not having the stream of water hit the shrimp on the sieve directly. Lay the shrimp out singly on the sieve as rinsed. Inspect each shrimp and use the rubber-tipped rod and the spray to remove the breaded material that may remain on any of them, being careful to avoid undue pressure or rubbing, and return each shrimp to the sieve. Remove the top sieve and drain on a slope for 2 minutes, then remove the shrimp to weighing pan. Rinse contents of the No. 20 sieve onto a flat pan and collect any particles other than breaded (i.e., flesh

main until the breaded becomes soft and can easily be removed from the still frozen shrimp material (between 10 seconds to 80 seconds for composite units held in storage at 0° F.). If the composite units were prepared using batters that are difficult to remove after one dipping, redip them for up to 5 seconds after the initial debreading and remove residual batter materials.

[NOTE: Several preliminary trials may be necessary to determine the exact dip time required for "debreading" the composite units in a sample. For these trials only, a saturated solution of copper sulfate (1 pound of copper sulfate in 2 liters of tap water) is necessary. The correct dip time is the minimum time of immersion in the copper sulfate solution required before the breaded can easily be scraped off: *Provided*, That the "debreaded" units are still solidly frozen and only a slight trace of blue color is visible on the surface of the "debreaded" shrimp material.]

(iii) Remove the unit from the bath; blot lightly with double thickness of paper toweling; and scrape off or pick out coating from the shrimp material with the spatula or nut picker.

(iv) Weigh all the "debreaded" shrimp material.

(v) Calculate the percentage of shrimp material in the sample, using the following formula:

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded sample}}{\text{Weight of sample}} \times 100 + 2$$

and tail fins) and add to shrimp on balance pan and weigh.

(ii) Calculate percent shrimp material:

§ 36.31 Frozen raw lightly breaded shrimp; identity; label statement of optional ingredients.

Frozen raw lightly breaded shrimp complies with the provisions of § 36.30,

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded shrimp sample}}{\text{Weight of sample}} \times 100$$

(h) The method for determining percentage of shrimp material for composite units, specified in paragraph (c) (6) of this section, is as follows:

(i) *Equipment needed.* (1) Water bath (for example a 3 liter to 4 liter beaker).

(ii) Balance accurate to 0.1 gram.

(iii) Clip tongs of wire, plastic, or glass.

(iv) Stop-watch or regular watch readable to a second.

(v) Paper towels.

(vi) Spatula, 4-inch blade with round tip.

(vii) Nut picker.

(viii) Thermometer (immersion type) accurate to $\pm 2^\circ$ F.

(ix) Copper sulfate crystals (CuSO₄ 5H₂O).

(2) *Procedure.* (i) Weigh all composite units in the sample while they are still hard frozen.

(ii) Place each composite unit individually in a water bath that is maintained at 63° F.-86° F., and allow to re-

except that it contains not less than 65 percent of shrimp material, as determined by the method prescribed in § 36.30 (g) or (h), as appropriate, and that in the name prescribed the word "lightly" immediately precedes the words "breaded shrimp."

Effective date. With the exception hereinafter set out, this order shall become effective 90 days from the date of its publication in the FEDERAL REGISTER. Subject to the condition that the labels used name the optional ingredients, the provision in § 36.30(f) requiring that these names are to be listed on the principal display panel or panels shall not become effective until December 31, 1965.

(Secs. 401, 701(e), 52 Stat. 1046, 1055 as amended, 70 Stat. 919; 21 U.S.C. 341, 371(e))

Dated: February 26, 1965.

GEO. P. LARRICK,
Commissioner of Food and Drugs.

PUBLIC HEALTH SERVICE

MEDICAL CARE FOR OWNER-OPERATORS OF COMMERCIAL FISHING VESSELS:

Owner-operators of commercial fishing vessels have been declared eligible for certain medical care at U. S. Public Health Service hospitals, out-patient clinics, and other medical facilities. Eligibility for such care was stated in amendments to Part 32, Code of Federal Regulations, Title 42.

Title 42—PUBLIC HEALTH**Chapter I—Public Health Service, Department of Health, Education, and Welfare****PART 32—MEDICAL CARE FOR SEAMEN AND CERTAIN OTHER PERSONS****Owner-Operators of Commercial Fishing Vessels**

On November 10, 1964, notice of proposed rule making regarding the regulations under Part 32, relating to eligibility for medical care of owner-operators of commercial fishing vessels, was published in the *FEDERAL REGISTER* (29 F.R. 15174). After consideration of all such relevant matter as was presented by interested persons regarding the rules proposed, the regulations as so published are hereby adopted without change.

Date: January 27, 1965.

[SEAL] LUTHER L. TERRY,
Surgeon General

Approved: February 9, 1965.

ANTHONY J. CELEBREZZE,
Secretary.

Part 32 is amended as follows:

1. Section 32.1 is amended by adding a new paragraph (1), to read as follows:

§ 32.1 Meaning of terms.

(1) "Commercial fishing operations" means the gathering of any form of either fresh water or marine animal life for sale on a commercial basis through available markets.

2. Section 32.6(a) is amended by adding a new subparagraph (12), to read as follows:

§ 32.6 Persons eligible.

(a) Under this part the following persons are entitled to care and treatment by the Service as hereinafter prescribed:

(12) Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by

The new regulations carry out Public Law 88-424 (signed by the President August 13, 1964), which restored to self-employed fishermen certain medical benefits they enjoyed prior to 1954.

Following are the new regulations as adopted and published in the *Federal Register*, February 17, 1965, by the U. S. Public Health Service:

seamen employed on such vessel or on vessels engaged in similar operations.

3. A new center heading and a new § 32.57 are added, to read as follows:

OWNER-OPERATORS OF COMMERCIAL FISHING VESSELS**§ 32.57 Conditions and extent of treatment.**

Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations shall be entitled to care and treatment by the Service under the same conditions, where applicable, and to the same extent as is provided for American seamen.

(Sec. 215, 58 Stat. 690, as amended; 42 U.S.C. 216. Interpret or apply sec. 322, 58 Stat. 696, as amended by 78 Stat. 898; 42 U.S.C. 249)

Note: See *Commercial Fisheries Review*, Jan. 1965 p. 98.

**Department of the Interior****GUIDELINES DEVELOPED FOR TESTING PESTICIDES:**

Guidelines for testing the toxicity of new pesticides to fish and wildlife have been developed by the Department of the Interior, it was announced March 17, 1965. The recommended procedures stem from experiments conducted by Interior under its intensified program to safeguard those important resources from poisoning. Facts about toxicity are needed by manufacturers of pesticides to support their applications for Government registration of new pesticide compounds.

Evaluation procedures, developed by Interior in cooperation with the National Agricultural Chemical Association, are similar to

those used by research stations of the U. S. Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. The procedures are intended to produce information on the lethal and sublethal toxicity of pesticides to a variety of animal, fish, and shellfish species. They are not considered to be the sole means of testing for toxicity.

The guidelines recommend procedures for obtaining data on:

1. Lethal and sublethal toxicity to mammals, required by the Departments of Agriculture and Health, Education, and Welfare.

2. Lethal toxicity to one species of waterfowl (mallard duck) and one of the follow-

ing: bobwhite quail, ring-neck pheasant or coturnix (Japanese quail).

3. Lethal toxicity data on rainbow trout as the representative of cold-water fish; and one of these warm-water fish: bluegill, goldfish, or channel catfish.

4. Sublethal toxicity on the eastern oyster as representative of the marine mollusks. Lethal tests cannot be made on the oyster because it closes its shell against a concentration of pesticides that would be fatal. The sublethal test shows the amount of reduction of shell growth caused by a pesticide.

The guidelines describe the feeding, housing, and temperature control for birds to be tested, the number of birds to be exposed to pesticides and their diets, and the periodic observations to be made. Similar recommendations are made for testing of fish.

The Department of the Interior said the Pesticides Review Staff of the Fish and Wildlife Service will assist manufacturers in evaluating any methods such producers devise to test pesticides.

* * * * *

REMOVAL OF CEILING ON PESTICIDE RESEARCH PROGRAM REQUESTED:

Congress has been asked for legislation which would remove the present ceiling placed on appropriations for pesticide research carried out by Federal agencies, announced the Department of Interior March 6, 1965. Secretary of the Interior Stewart L. Udall said the measure would implement President Johnson's request for increased research efforts to learn more about the effects of pesticides in the environment.

The research program which was authorized in 1958 directed the Secretary of the Interior to undertake a comprehensive study of the effects of pesticides on fish and wildlife. The following year Congress voted an annual appropriation of \$2,565,000 for Interior to carry out the work. This is the present ceiling on annual pesticide research appropriations.

In a message to Congress on February 8, 1965, President Johnson said, "I have asked the Secretary of the Interior to eliminate the ceiling on pesticide research." Under this ceiling, Interior's Fish and Wildlife Service is conducting studies of the toxic effects, both

acute and chronic, of pesticides on selected species of fish and wildlife. The Bureau of Sport Fisheries and Wildlife is developing techniques of discovering and measuring pesticide residues in the tissues and organs of fish and wildlife. It also is conducting field observations of the fish and wildlife environment before and after the spraying of pesticide chemicals.

Secretary Udall said that Bureau scientists have found residues of some common pesticides in fauna collected in nearly every part of the United States. Increased research is needed to learn more about the possible presence of many more pesticidal materials in fish and wildlife, and the effects the chemicals have on survival, reproduction and growth of fish and wildlife, he said. "The acute and chronic effects resulting from exposure to combinations of such toxic agents is likewise largely unknown, although related studies have shown that one chemical may heighten the effect of another," Secretary Udall added.

While some of the residue levels of pesticides are not considered dangerous to humans, they may be well above the levels tolerated by more sensitive forms of animal life, such as fish and shellfish, the Secretary explained. He said expanded research is needed to determine these effects, and where they are found to be harmful, to seek substitute methods of pest control that are more selective and do not persist in the environment for prolonged periods.

FISH AND WILDLIFE SERVICE

PROPOSED REVISED U. S. STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP:

Notice of a proposed revision of United States standards for grades of frozen raw breaded shrimp (as an amendment to Title 50, Code of Federal Regulations, Part 262) was published by the Secretary of the Interior in the Federal Register, March 18, 1965.

The proposed revision would upgrade the standards for frozen raw breaded shrimp grades, particularly as concerns: (1) uniformity, (2) condition of coating (batter and breading), and (3) quality loss in shrimp prior to processing. The evaluation factors for flavor and odor would also be upgraded.

Breeding levels for frozen raw breaded shrimp are specified in Sec. 262.2 of the proposed revised grade standards as follows:

(a) Style I. "Regular Breaded Shrimp" are frozen raw breaded shrimp containing a minimum of 50 percent of shrimp material.

(b) Style II. "Lightly Breaded Shrimp" are frozen raw breaded shrimp containing a minimum of 65 percent of shrimp material.

(Those breeding levels correspond, respectively, with those in the standards of identity for "frozen raw breaded shrimp" and "frozen raw lightly breaded shrimp" published by the U. S. Food and Drug Administration in the

Federal Register, March 5, 1965, to become effective June 3, 1965.)

Interested persons were given the opportunity to submit written comments, suggestions, or objections concerning the proposed revised standards by April 17, 1965, with the Director, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C. 20240.

Following are the proposed revised standards for grades of frozen raw breaded shrimp as published in the Federal Register, March 18, 1965:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 262]

FROZEN RAW BREADED SHRIMP

Proposed Standards for Grades

MARCH 11, 1965.

Notice is hereby given that pursuant to sections 203 and 205 of Title II of the Agricultural Marketing Act of 1946, 60 Stat. 1087, 1090, as amended, 7 U.S.C. sections 1622 and 1624 (1958), as transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of 1956, 70 Stat. 1122 (1956), 16 U.S.C. section 742e (1958), the Secretary of the Interior proposes to amend Title 50, Code of Federal Regulations so as to provide for the upgrading of frozen raw breaded shrimp standards for grades as set forth in the following proposed regulations.

It is the policy of the Department of the Interior whenever practicable, to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendment to the Director, Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C.; 20240, within 30 days of the date of publication of this notice in the FEDERAL REGISTER.

JOHN A. CARVER, Jr.,
Under Secretary of the Interior.

PART 262—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP¹

PRODUCT DESCRIPTION, STYLES, TYPES, AND GRADES

Sec.	
262.1	Product description.
262.2	Styles of frozen raw breaded shrimp.
262.3	Types of frozen raw breaded shrimp.
262.4	Grades of frozen raw breaded shrimp.

FACTORS OF QUALITY

262.11	Ascertaining the grade.
262.12	Factors evaluated on product in the frozen state.
262.13	Factors evaluated on product in the thawed state.

¹ Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

DEFINITIONS AND METHODS OF ANALYSIS

262.21 Definitions and methods of analysis.

LOT CERTIFICATION TOLERANCES

262.25 Tolerances for certification of officially drawn samples.

AUTHORITY: The provisions of this Part 262 issued under section 6, 70 Stat. 1122, 16 U.S.C. section 742e; and sections 203 and 205, 60 Stat. 1087, 1090, as amended, 7 U.S.C. 1622, 1624.

PRODUCT DESCRIPTION, STYLES, TYPES, AND GRADES

§ 262.1 Product description.

Frozen raw breaded shrimp are whole, clean, wholesome, headless, peeled, and deveined shrimp, of the regular commercial species, coated with a wholesome, suitable batter and/or breading. Whole shrimp consist of five or more segments of unutilized shrimp flesh. They are prepared and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. Frozen raw breaded shrimp contain not less than 50 percent by weight of shrimp material. Individual shrimp and/or pieces consolidated into larger units and covered with breading are not considered for grading under this standard.

§ 262.2 Styles of frozen raw breaded shrimp.

(a) *Style I.* "Regular Breaded Shrimp" are frozen raw breaded shrimp containing a minimum of 50 percent of shrimp material.

(b) *Style II.* "Lightly Breaded Shrimp" are frozen raw breaded shrimp containing a minimum of 65 percent of shrimp material.

§ 262.3 Types of frozen raw breaded shrimp.

(a) *Type I—Breaded fantail shrimp—*
(1) *Subtype A.* Split (butterfly) shrimp with the tail fin and the shell segment immediately adjacent to the tail fin.

(2) *Subtype B.* Split (butterfly) shrimp with the tail fin but free of all shell segments.

(3) *Subtype C.* Split (butterfly) shrimp without attached tail fin or shell segments.

(b) *Type II—Breaded round shrimp—*
(1) *Subtype A.* Round shrimp with the tail fin and the shell segment immediately adjacent to the tail fin.

(2) *Subtype B.* Round shrimp with the tail fin but free of all shell segments.

(3) *Subtype C.* Round shrimp without attached tail fin or shell segments.

§ 262.4 Grades of frozen raw breaded shrimp.

(a) "U.S. Grade A" is the quality of frozen raw breaded shrimp that when cooked possesses a good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen raw breaded shrimp that when cooked possesses a reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen raw breaded shrimp that fail to meet the requirements of "U.S. Grade B."

FACTORS OF QUALITY

§ 262.11 Ascertaining the grade.

General. In addition to considering other requirements outlined in the standard, the following quality factors are evaluated in ascertaining the grade of the product.

(a) Factors not rated by score points: Flavor and odor. Flavor and odor are determined by organoleptic means after the product has been cooked in a suitable manner (§ 262.21(w)).

(b) Factors rated by score points: The quality of the product with respect to factors scored is expressed numerically on the scale of 100. Deductions from the maximum possible score of 100 are assessed for essential variations of quality within each factor. The score of frozen raw breaded shrimp is determined by observing the product in the frozen and thawed states.

§ 262.12 Factors evaluated on the product in the frozen breaded state.

Factors affecting qualities that are measured on the product in the frozen state are: Loose breading and frost, ease of separation, uniformity of size, condition of coating, extraneous material, and damaged breaded shrimp. For the purpose of rating the factors that are scored in the frozen state, the schedule of point deductions in Table 1 applies. This schedule of point deductions is based on the examination of one complete indi-

vidual package (sample unit) regardless of the net weight of the contents of the package.

§ 262.13 Factors evaluated on thawed debreaded product.

Factors affecting qualities that are measured on the product in the thawed debreaded state are: Degree of deterioration, dehydration, sand veins, black spot, extra shell, extraneous material,

and swimmerets. For the purpose of rating the factors that are scored in the thawed debreaded state, the schedule of point deductions in Table 2 applies. This schedule of point deductions is based on the examination of 20 whole shrimp selected at random from one or more packages. Examinations of this sample of 20 whole shrimp is continued under § 262.21(u).

TABLE 1—SCHEDULE OF POINT DEDUCTIONS FOR RATING IN FROZEN BREADED STATE

Factor	Quality description	Deductions allowed
		<i>Points</i>
1. Loose breading or frost.....	2 percent but less than 3 percent..... 3 percent but less than 5 percent..... 5 percent or more.....	5 10 31
2. Ease of separation.....	Separate easily after being removed from carton and exposed to room temperature for not more than 4 minutes..... Separate easily after being removed from carton and exposed to room temperature for not more than 6 minutes..... Does not separate easily after being removed from carton and exposed to room temperature for 6 minutes.....	3 6 10
3. Uniformity.....	Ratio of weight of largest to smallest breaded shrimp in sample unit as defined under section 262.21(u): Up to 1.50..... 1.51-1.60..... 1.61-1.70..... 1.71-1.80..... 1.81-1.90..... 1.91-2.00..... 2.01-2.10..... 2.11-2.20..... 2.21-2.30..... 2.31-2.40..... Over 2.40.....	0 1 2 3 4 5 6 7 8 9 10
4. Condition of coating.....	Degree of halo or balling up or holidays (identify type of defect by circling the proper word): Slight—each 10 percent by count or fraction thereof..... Moderate—each 10 percent by count or fraction thereof..... Marked—each 10 percent by count or fraction thereof..... Excessive—each 10 percent by count or fraction thereof.....	1 1 2 16
5. Damaged breaded shrimp.....	For each 5 percent by count or fraction thereof..... Tail fin broken or missing, each 5 percent or fraction thereof (except in Type I, subtype C, and Type II, subtype C).....	3 1
6. Extraneous material.....	If extraneous material, except filthy or deleterious substances, are found in more than one package per lot, the entire lot shall be declared substandard. ¹	

¹ Filthy or deleterious substances in food products constitute a violation of the Food, Drug, and Cosmetic Act. Products containing such substances are ineligible for the purpose of applying this document.

TABLE 2—SCHEDULE FOR POINT DEDUCTIONS FOR EXAMINATION IN THAWED, DEBREADED STATE

DEDUCTIONS BASED ON 20 SHRIMP

[Subtotals brought forward]

Factor	Quality description	Deductions allowed
		<i>Points</i>
1. Degree of dehydration.....	Slight—each shrimp..... Moderate—each shrimp..... Marked—each shrimp..... Excessive—each shrimp.....	1 2 3 16
2. Deterioration.....	Slight—each shrimp..... Moderate—each shrimp..... Marked—each shrimp..... Excessive—each shrimp (provided that, if excessive deterioration occurs in more than one sample unit per sample, the entire lot shall be declared substandard).....	2 5 10 29
3. Sand veins.....	For each dark vein present deduct according to the following schedule: Equivalent in length to two segments..... Equivalent in length to three segments..... Equivalent in length to four or more segments.....	1 2 3
4. Black spot.....	Slight but obvious, on average..... Moderate, on average..... Marked—each shrimp.....	3 6 3
5. Extra shell (see subtypes definition).....	(Beyond first segment adjacent to tail fin only for Type I, subtype A, and Type II, subtype A): Less than one whole extra shell segment..... One extra segment or more.....	1 3
6. Swimmerets.....	For last pair only adjacent to tail fins..... For more than last pair.....	1 3
7. Damaged shrimp.....	For each shrimp..... Tail fin broken or missing, each 5 percent (except in Type I, subtype C, and Type II, subtype C).....	3 1
8. Extraneous material.....	If extraneous material, except filthy or deleterious substances, are found in more than one package per lot, the entire lot shall be declared substandard. ¹	

¹ Filthy or deleterious substances in food products constitute a violation of the Food, Drug, and Cosmetic Act. Products containing such substances are ineligible for the purpose of applying this document.

DEFINITIONS AND METHODS OF ANALYSIS

§ 262.21 Definitions and methods of analysis.

(a) "Fantail shrimp": This type is prepared by splitting and peeling the shrimp except that for subtype A, the tail fin remains attached and the shell segment immediately adjacent to the tail fin remains attached. Subtype B, the tail fin remains, but the shrimp are free of all shell segments. Subtype C, the shrimp are free of tail fins and all shell segments.

(b) "Round shrimp": This type is the round shrimp, not split. The shrimp are peeled except that for subtype A, the tail fin remains attached and the shell segment immediately adjacent to the tail fin remains attached. Subtype B, the tail fin remains, but the shrimp are free of all shell segments. Subtype C, the shrimp are free of all shell segments and tail fins.

(c) Good flavor and odor: "Good flavor and odor", essential requirements for a Grade A product, means that the cooked product has flavor and odor characteristics of freshly caught or well-refrigerated shrimp and the breading is free from staleness and off-flavors and i-odors of any kind. Iodoform is not to be considered in evaluating the product for flavor and odor.

(d) Reasonably good flavor and odor: "Reasonably good flavor and odor" minimum requirement of Grade B products, means that the cooked product may be somewhat lacking in the good flavor and odor characteristics of freshly caught or well-refrigerated shrimp but is free from objectionable off-flavors and objectionable off-odors of any kind.

(e) "Dehydration" refers to the occurrence of whitish areas on the exposed ends of the shrimp (due to the drying of the affected area) and to a generally desiccated appearance of the meat after the breading is removed.

(f) "Deterioration" refers to any detectable change from the normal good quality of freshly caught shrimp. It is evaluated by noting in the thawed product deviations from the normal odor and appearance of freshly caught shrimp.

(g) "Extraneous material" consists of non-edible material such as sticks, seaweed, shrimp thorax, or other objects that may be accidentally present in the package.

(h) Slight: "Slight" refers to a condition that is scarcely noticeable but does affect the appearance, desirability, and/or eating quality of breaded shrimp.

(i) Moderate: "Moderate" refers to a condition that is conspicuously noticeable but that does not seriously affect the appearance, desirability, and/or eating quality of the breaded shrimp.

(j) Marked: "Marked" refers to a condition that is conspicuously noticeable and that does seriously affect the appearance, desirability, and/or eating quality of the breaded shrimp.

(k) Excessive: "Excessive" refers to a condition that is very noticeable and is seriously objectionable and the product cannot be graded above Grade B; this is a limiting rule.

(l) Halo: "Halo" means an easily recognized fringe of excess batter and breading extending beyond the shrimp flesh and adhering around the perimeter or flat edges of a split (butterfly) breaded shrimp.

(m) **Balling up:** "Balling up" means the adherence of lumps of the breading material to the surface of the breaded coating, causing the coating to appear rough, uneven, and lumpy.

(n) **Holidays:** "Holidays" means voids in the breaded coating as evidenced by bare or naked spots.

(o) **Damaged frozen raw breaded shrimp:** "Damaged frozen raw breaded shrimp" means frozen raw breaded shrimp that have been separated into two or more parts or that have been crushed or otherwise mutilated to the extent that their appearance is materially affected.

(p) **Damaged shrimp (thawed state):** "Damaged shrimp" are those that have been mashed, physically or mechanically injured, or mutilated to the extent that their appearance is materially affected. Deductions should not be made on same shrimp receiving deductions for damage in the frozen state.

(q) **Black spot:** "Black spot" means any blackened area that is markedly apparent on the flesh of the shrimp.

(r) **Sand vein:** "Sand vein" means any black or dark sand vein that has not been removed, except for that portion under the shell segment adjacent to the tail fin when present.

(s) **Extra shell:** "Extra shell" means any shell segment(s) or portion thereof, contained in the breaded shrimp except the first segment adjacent to the tail fin for Type I, subtype A, and Type II, subtype A.

(t) **Loose breading and frost:** "Loose breading and frost" is considered to be part of the net weight and is determined by use of a balance and by following the steps given below:

1. Remove the overwrap.
2. Weigh carton and all contents.
3. Transfer breaded shrimp to balance and weigh.
4. Weigh carton less shrimp but including waxed separators and inserts (if used), crumbs, and frost.
5. Remove crumbs and frost from carton and separators.
6. Weigh cleaned carton and separators.
7. Calculate loose breading and frost:

Percent loose breading and frost

$$= \frac{(4)-(6)}{(2)-(6)} \times 100.$$

A proportionate amount of the loose breading and frost must be added to the weight of the sample in paragraph (v) (2) (ii) of this section.

(u) **Uniformity:** "Uniformity" is determined for packs of various sizes by the ratio of the weights of the largest to the smallest breaded shrimp as outlined by the following schedule:

Up to 10 oz.	3 largest/3 smallest
10.1 oz. to 1.5 lb.	6 largest/6 smallest
1.51 lb. to 2.5 lb.	8 largest/8 smallest
Over 2½ lb.	10 largest/10 smallest

(v) **Percent shrimp material:** "Percent shrimp material" means the percent by weight of shrimp material in a sample

preferably with spray attached, and rinse the shrimp without rubbing the flesh, being careful to keep all rinsings over the sieves and not having the stream of water hit the shrimp on the sieve directly. Use a rubber policeman to remove adhering breading. Lay the shrimp out singly on the sieve as rinsed, split side down and tails up. Remove top sieve and drain on a 45-degree angle for 2 minutes, then transfer shrimp to balance. Rinse contents of the No. 20 sieve onto a shallow baking pan and collect any particles of shrimp material (flesh, tailfin), and add to shrimp on balance and weigh.

(ii) Calculate percent shrimp material:

$$\text{Percent shrimp material} = \frac{\text{Weight of debreaded sample}}{(\text{Weight of sample}) + (\text{weight of sample} \times \text{percentage loose breading and frost})} \times 100$$

as determined by the method described below or other methods giving equivalent results. This calculation is based on 20 whole shrimp as stipulated in § 262.13.

(1) **Equipment needed:**

- (i) Two-gallon container approximately 9 inches in diameter.
- (ii) Two-waned wooden paddle, each vane measuring approximately 1¼ inches by 3¼ inches.
- (iii) Stirring device capable of rotating the wooden paddle at 120 rpm.
- (iv) Balance accurate to 0.01 ounce (0.1 gram).
- (v) U.S. standard sieve—½-inch sieve opening; 12-inch diameter.
- (vi) U.S. standard sieve—ASTM—No. 20, 12-inch diameter.
- (vii) Forceps, with blunt points.
- (viii) Shallow baking pan.
- (ix) Rubber policeman to remove bits of breading from shrimp.

(2) **Procedure:**

(i) Weigh sample (20 shrimp) to be debreaded. Fill container three-fourths full of water at 70°-80° F. Suspend the paddle in the container leaving a clearance of at least 5 inches below the paddle vanes, and adjust speed to 120 rpm. Add shrimp and stir for 10 minutes. Stack the sieves, the ½-inch mesh over the No. 20 and pour contents of container onto them. Set the sieves under a faucet,

(w) **Cooked in a suitable manner:** "Cooked in a suitable manner" means cooked in accordance with the instructions accompanying the product. If, however, specific instructions are lacking, the product for inspection is cooked as follows:

(1) Transfer the breaded shrimp, while still frozen, in a wire mesh deep fry basket sufficiently large to hold the shrimp in a single layer without touching one another.

(2) Lower the basket into a suitable liquid oil or hydrogenated vegetable oil at 350°-375° F. Cook for 3 minutes, or until the shrimp attain a pleasing golden brown color.

(3) Remove basket from the oil and allow the shrimp to drain for 15 seconds. Place the cooked shrimp on a paper towel or napkin to absorb the excess oil.

LOT CERTIFICATION TOLERANCES

§ 262.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 260 of this chapter (Regulations Governing Processed Fishery Products, 25 F.R. 8427, Sept. 1, 1960).

* * * * *

HEARING ON APPLICATION FOR FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY:

Waasy T. Franks and Carmel F. Franks, Fort Myers, Fla., have applied for a fishing vessel construction differential subsidy to aid in the construction of an 85-foot overall steel vessel to engage in the fishery for shrimp (including royal-red shrimp), snapper, grouper, and Atlantic tuna.

A hearing on the economic aspects of this application was scheduled to be held on April 6, 1965, in Washington, D. C.

Notice of the application and hearing was published in the Federal Register, March 5, 1965.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISIONS

WAGE ORDER FOR FOOD AND RELATED PRODUCTS INDUSTRY IN PUERTO RICO:

A wage order setting new minimum wage rates under the Fair Labor Standards Act in the food and related products industry in Puerto Rico was published by the U. S. Labor Department in the Federal Register, March 17, 1965, to become effective April 3, 1965, as a revision of Title 29, Code of Federal Regulations, Part 673.2.

The revised regulations did not change the minimum wage rate for tuna canneries which

was already at the \$1.25 hourly minimum effective on the mainland.

Note: See Commercial Fisheries Review, March 1965 p. 100.



Small Business Administration

LOAN APPROVED FOR CRAB PROCESSING FIRM IN ALASKA:

The Small Business Administration has approved a \$218,000 loan to the Greater Anchorage Development Corp., Congressman Ralph J. Rivers reported February 24, 1965. He said the money will be lent in turn to Theodore Seafoods, Inc., of Cordova, Alaska, to purchase a vessel and convert it for crab processing and cold-storage and to construct a dock. (The Seattle Times, February 25, 1965.)



Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ANADROMOUS FISH CONSERVATION: The Vice President, Mar. 22, 1965, presented to the Senate a joint resolution of the State of California, for the Congress of the United States to enact legislation on the protection, enhancement and improvement of salmon and anadromous fish, so that the Federal Government can participate in efforts to preserve and enhance this vital resource; to Committee on Commerce.

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT: House Speaker, Mar. 25, 1965, presented memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States for full appropriation support for the com-

mercial Fisheries Research and Development Act of 1964; to Committee on Appropriations.

Senate received Apr. 1, 1965, a resolution (S. J. Res. 48) of the Legislature of the State of Alaska similar to that received by the House; to Committee on Appropriations.

COMMODITY PACKAGING AND LABELING: H. R. 6070 (Corman) introduced in House, Mar. 10, 1965, to amend the Clayton Act to prohibit restraints of trade carried into effect through the use of unfair and deceptive methods of packaging or labeling certain consumer commodities distributed in commerce, and for other purposes; to Committee on the Judiciary.

EXPORT EXPANSION ACT OF 1965: Senate Committee on Commerce held hearings Mar. 17-18, 22, 1965, on S. 558, proposed Export Expansion Act of 1965; hearings recessed subject to call.

Rep. Adams of Washington in extension of remarks in Congressional Record, Mar. 29, 1965 (p. A1475), inserted a statement he made before the Senate Commerce Committee on Mar. 17, 1965, re the Export Expansion Act of 1965.

FISHERIES LOAN FUND EXTENSION: Introduced in House, H. R. 6090 (O'Neill of Mass.) and H. R. 6101 (Tupper) Mar. 10, 1965, H. R. 6362 (Keith) Mar. 16, and H. R. 6921 (Bates) Mar. 30, to extend the term during which the Secretary of the Interior is authorized to make fisheries loans under the Fish and Wildlife Act of 1956, and for other purposes; to Committee on Merchant Marine and Fisheries.

Representative Keith remarked (Congressional Record, Mar. 16, 1965; p. 4971) that: "... The effectiveness of this program and its contribution to the economic welfare of our fishing fleet is indicated by statistics from the Bureau of Commercial Fisheries, which administers the act: As of July 31, 1964, the Bureau reports that a total of 142 fishing vessels had been replaced and 588 others had been converted, rebuilt, repaired, or reequipped with new gear or new engines under the act. In addition, 280 vessel mortgages and lienable debts of another 255 vessels were refinanced. Many of these were multipurpose loans. In other words, more than 1,000 vessels have been aided in their continued operation by this program--vessels that conceivably might have otherwise been lost to our beleaguered fishing industry. . . ."

House Speaker, Mar. 22, 1965, presented a memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States to approve pending legislation to extend the term during which the Secretary of the Interior is authorized to make fisheries loans under the Fish and Wildlife Act of 1956; to Committee on Merchant Marine and Fisheries.

The Vice President, Mar. 25, 1965, presented to the Senate a resolution (S. J. Res. 40) of the Legislature of Alaska urging that Congress pass, and the President of the United States approve S. 998 (would amend the Fish and Wildlife Act of 1956 so as to extend until 1975 the authority of the Secretary of the Interior to make loans for financing and refinancing the operations of commercial fishing vessels and their maintenance and repair); to the Committee on Commerce.

FISH HATCHERIES: Sen. Bennett remarked (Congressional Record, Mar. 8, 1965, pp. 4210-4212) in the Senate on funds for the proposed Jones Hole National

Fish Hatchery in Utah. He inserted a letter he received from the Director of the Bureau of Sport Fisheries and Wildlife and his exchange of correspondence with the Director of the Bureau of the Budget on the subject.

FISH FARMING: Senator Carlson in Congressional Record, Mar. 22, 1965 (p. 5319) remarked that an interesting proposal for supplying farmers of Kansas with a new source of farm income is rapidly reaching a stage of practical operation. Proposal provides for a landowner to construct water impoundments, generally known as farm ponds, for the purpose of fish farming. In the near future information on production and marketing will be available to those farmers interested.

FOOD FOR PEACE: Sen. Bartlett pointed out in Congressional Record, Apr. 1, 1965 (pp. 6396-6397) that President Johnson has sent to Congress the annual report on the food-for-peace program, outlining the importance of the program to our agricultural interests and developing foreign trade; also that an effort was being made to improve the nutritional balance in the commodities sold under the program. The Senator said, "In my opinion, this essential balance cannot be obtained unless the administration implements the law, recently enacted, which permits high protein fishery products to be added to the food-for-peace program"

FOOD MARKETING NATIONAL COMMISSION: S. 1555 (Magnuson and 4 others) introduced in House, Mar. 17, 1965, to extend for 1 year the date on which the National Commission on Food Marketing shall make a final report to the President and to the Congress and to provide necessary authorization of appropriations for such Commission; to Committee on Commerce.

House Committee on Agriculture, Mar. 26, 1965, filed report (H. Rept. 207) without amendment on H. R. 5702, similar to S. 1555; to the Committee of the Whole House on the State of the Union.

H. Rept. 207, Extension of National Commission on Food Marketing (Mar. 26, 1965, report from the Committee of the Whole House on the State of the Union, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 5702), 4 pp., printed. Committee reported bill favorably without amendment and recommended passage. Contains purpose, cost, executive communication, and changes in existing law.

GREAT LAKES COMMERCIAL FISHERMEN'S PROBLEMS: Sen. Proxmire in Congressional Record, Mar. 29, 1965 (pp. 5984-5986) spoke in the Senate and gave these reasons for the serious decline in the fisheries of the Great Lakes: (1) the serious loss through sea lamprey depredation, (2) pollution of the lakes and their tributary streams, (3) adverse effects on fish consumption, and (4) inefficient industry practices. He also inserted a statement, "What is Wrong in Great Lakes Fisheries and What Can Be Done About It?" submitted by Gerald Bolda, president of the Midwest Federated Fisheries Council.

INTERIOR DEPARTMENT: Sen. Committee on Commerce held hearings on the nomination of Stanley A. Cain, of Michigan, Mar. 16, 1965, to be Assistant Secretary of the Interior for Fish and Wildlife.

INTERIOR DEPARTMENT APPROPRIATIONS REQUEST, FY 1966: Department of the Interior and Related Agencies Appropriations for 1966: Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, Eighty-Ninth Congress,

1st session; Part 1, Department of the Interior (except Bonneville Power Administration, Bureau of Reclamation, Southeastern Power Administration and Southwestern Power Administration), 1,592 pp., printed; Part 2, Related Agencies, Testimony of Members of Congress, Interested Individuals, and Organizations, 975 pp., printed. Included are testimony, statements and exhibits relating to funds for the Fish and Wildlife Service: the Office of the Commissioner, and its two bureaus, Commercial Fisheries and Sport Fisheries and Wildlife.

H. R. 6767 (Denton) introduced in House, Mar. 25, 1965, bill making appropriations for the Department of the Interior and related agencies (includes the United States Fish and Wildlife Service and its two Bureaus: Commercial Fisheries, and Sport Fisheries and Wildlife) for the fiscal year ending June 30, 1966, and for other purposes. Same day House Committee on Appropriations reported favorably to the House H. R. 6767.

House Committee on Appropriations filed a report, (H. Rept. 205) Mar. 25, without amendment on H. R. 6767; to Committee of the Whole House on the State of the Union.

H. Rept. 205, Department of the Interior and Related Agencies Appropriation Bill 1966 (Mar. 25, 1966, report from the Committee on Appropriations, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 6767), 55 pp., printed. Committee submitted report in explanation of the bill making appropriations for the Department of the Interior and related agencies (includes the U. S. Fish and Wildlife Service and its two Bureaus: Commercial Fisheries and Sport Fisheries and Wildlife) for fiscal year 1966. Contains summary of bill, revenues, summary of increases and decreases, extent of activities funded in bill, and agency by agency discussion of funds requested.

By a voice vote the House, Mar. 30, 1965, passed H. R. 6767. As approved by the House, the bill would provide \$35,551,000 for the Bureau of Commercial Fisheries. Included in the House-passed bill is \$4 million (\$2 million more than requested) to implement the Commercial Fisheries Research and Development Act of 1964 (P. L. 88-309) so that \$3,750,000 would be for aid to states under section 4 (a) of the Act, \$100,000 under section 4 (b) of the Act to continue the special cooperative study to develop a virus-resistant oyster in the four Middle Atlantic States, and \$150,000 for program administration; and \$5 million to carry out the Fishing Fleet Improvement Act of 1964 (P. L. 88-498), since the new Act extends the date for the acceptance of applications to June 30, 1969, extends coverage to the entire commercial fishing industry, authorizes appropriation of \$10,000,000 annually for the program, and increases the subsidy from 33-1/3 percent to 50 percent. Under Management and Investigations of Resources, the net increase over 1965 is primarily to provide a direct appropriation to finance activities funded during the current year by transfer of \$2,125,000 from the Pribilof Islands Fund. Under Construction, the net increase in the budget estimate is in the Columbia River fishery facilities program and consists of: a decrease of \$60,000 for management techniques, a reduction of \$40,000 in program supervision and engineering, and an increase of \$600,000 for replacement of the fishway at Willamette Falls, Oreg.

For Bureau of Sport Fisheries and Wildlife, the House would provide \$49,397,800 instead of the budget estimate of \$46,885,000. For the Office of the Commissioner of Fish and Wildlife, the House would provide \$444,000, the same as the budget estimate.

House, Apr. 1, 1965, asked for concurrence of the Senate on H. R. 6767.

Subcommittee of Senate Committee on Appropriations, Mar. 10, 1965, concluded its hearings on 1966 budget estimates for the Department of the Interior.

Sen. Neuberger in Congressional Record, of Mar. 10, 1965 (p. 4501), inserted House Joint Memorial 10 of the Oregon Legislature, calling on Congress to appropriate Federal funds for the installation of the Willamette Falls Fishway, on the Willamette River at Oregon City, under the Federally financed Columbia River fishery development program.

LAKE ERIE WATER POLLUTION: H. R. 6185 (Vigorito) introduced in House Mar. 11, 1965, to provide grants for assistance in the research of the waters of Lake Erie; to Committee on Interstate and Foreign Commerce.

MARINE BIOLOGICAL LABORATORY: House, Mar. 29, 1965, received a letter from the Under Secretary of the Interior, transmitting a draft of proposed legislation entitled "A bill relating to the use by the Secretary of the Interior of land at La Jolla, California, donated by the University of California for a marine biological research laboratory, and for other purposes"; to Committee on Merchant Marine and Fisheries.

Senate, Apr. 1, 1965, received a letter from the Under Secretary of the Interior similar to that received by the House; to Committee on Commerce.

MARINE EXPLORATION AND DEVELOPMENT ACT: H. R. 6009 (Keith) introduced in House, Mar. 9, 1965, to provide a program of marine exploration and development of resources of the Continental Shelf; to Committee on Interior and Insular Affairs. Representative Keith in the House remarked (Congressional Record, Mar. 10, 1965, pp. 4612-4613) that H. R. 6009 would create a Marine Exploration and Development Commission and charge that high-level Commission with the responsibility of formulating and executing a program of exploration and development of the vast resources of the Continental Shelf and the waters above the shelf. Similar to S. 1091.

House Committee on Interior and Insular Affairs was discharged from further consideration of H. R. 6009 on Mar. 15, and of H. R. 5884 on Mar. 17.

Senator Bartlett inserted in the Congressional Record, Mar. 18, 1965 (pp. 5269-5272), a statement ("Engineering for Marine Exploration and Development") of the need for marine exploration and development by Dr. Edward Wenk, Jr., Chief of the Science Policy Research Division in the Library of Congress, before the American Society of Civil Engineers, in New York City.

MINIMUM WAGE: Senate received Apr. 1, 1965, concurrent resolution (Con. Res. 95) from the Legislature and the Senate of the State of New York memorializing the Congress to amend the Federal Fair Labor Standards Act of 1938, increasing the minimum wage thereunder to \$1.50 per hour; to Committee on Labor and Public Welfare in Senate, and to Committee on Education and Labor in House.

OCEANOGRAPHY: Oceanography--Ships of Opportunity: Hearings before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, U. S. House of Representatives, 89th Congress,

1st session, Jan. 22, 1965, Serial No. 89-1, 53 pp., illus., printed. Purpose was to see whether or not a valuable contribution could be made to oceanography by taking advantage of presently existing seagoing platforms engaged in commercial pursuits. Also, the possibility of the greater use of the merchant fleet for the collection of oceanographic survey data and to determine whether or not oceanographic data could be collected by merchant ships on a truly not-to-interfere basis.

OCEANOGRAPHIC AGENCY OR COUNCIL: Senate Committee on Commerce resumed hearings, Mar. 16, 1965, to receive testimony on the coordination of the oceanographic program, and on S. 944, proposed National Oceanographic Act of 1965, providing for expanded research in the oceans and in the Great Lakes. Hearings recessed subject to call.

H. R. 6457 (Ashley) and H. R. 6512 (Fulton of Pa.) introduced in House Mar. 18, 1965, to provide for a comprehensive, long-range, and coordinated national program in oceanography, and for other purposes; to Committee on Merchant Marine and Fisheries. Rep. Ashley remarked in the House (Congressional Record, Mar. 18, pp. 5217-5218) that the objective is to establish a program that will enable the United States to attain mastery of the seas without imposing upon the rights and prerogatives of the executive and legislative branches of Government. Would establish a comprehensive, coordinated national program of oceanographic research, exploration and engineering, guided and reviewed by the Congress, prosecuted by the executive, and joined in by all the people. Direction of the program is appropriately assigned to the President, who would be aided by a National Oceanographic Council within his Federal Council for Science and Technology. Also would bring the Great Lakes under the umbrella of the national oceanographic program.

House Speaker, Mar. 23, 1965, presented a memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States relative to the creation of a National Oceanographic Council; to Committee on Merchant Marine and Fisheries.

The Vice President, Mar. 25, 1965, presented to the Senate a resolution (Alaska H. J. Res. 23) of the Legislature of the State of Alaska, urging the enactment of S. 944 (provides for coordination of all Federal oceanographic activities by a proposed National Oceanographic Council) by the Congress; to Committee on Commerce.

Representative Hanna in the House remarked (Congressional Record, Mar. 10, 1965, pp. 4617-4619) that what was needed for the Nation's oceanography program was: An information collection center which provides both a storage facility and a retrieval service. Also that our approach to finding a new and more vital thrust into the understanding and uses of the sea should rest on an announced national policy. He suggests that such a policy, after being broadly stated, be further specifically addressed to at least the following 10 separate divisions in oceanography: climate, energy, food, medicine, minerals and petroleum, recreation, security, transportation and communication, waste and water.

OCEANOGRAPHIC RESEARCH AND SURVEY OF COMMERCIAL FISHERY RESOURCES OF THE UNITED STATES: Senator Kennedy of Mass. inserted in Congressional Record, Mar. 22, 1965 (p. 5349) an editorial ("Two Sound Bills") from the Feb. 10, 1965, issue of the Standard-Times of New Bedford, Mass. Of the measures referred to, one would remove certain restrictions

that handicap the operation of oceanographic research ships such as those of the Woods Hole Oceanographic Institution, at Woods Hole, Mass., and the other would authorize an overall survey of the commercial fishery resources of the United States.

PASSAMAQUODDY TIDAL POWER PROJECT: Sen. Smith and 1 other presented a joint resolution of the Legislature of the State of Maine memorializing Congress and recommending full development of electric power potential of Passamaquoddy Bay and Upper St. John River.

PESTICIDES AND FISH AND WILDLIFE: S. 1623 (Magnuson and Neuberger) introduced in Senate, Mar. 25, 1965, to amend the Act of August 1, 1958, relating to a continuing study by the Secretary of the Interior of the effects of insecticides, herbicides, fungicides, and other pesticides upon fish and wildlife for the purpose of preventing losses to this resource; to Committee on Commerce. Sen. Magnuson in Congressional Record, Mar. 25, 1965 (pp. 5658-5659) pointed out that the authorization for pesticide research by the Department of the Interior is now limited to an annual appropriation of \$2,565,000 and that the bill would eliminate that ceiling.

PRICE DISCRIMINATION PRACTICES: S. 1484 (McCarthy and 7 others) introduced in Senate Mar. 19, 1965, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the right of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; to Committee on Commerce.

RESOURCES AND CONSERVATION ACT: Representative Ullman in extension of remarks (Congressional Record, Mar. 11, 1965, pp. A1135-A1136) referred to an article in the Washington Post for Mar. 5, in which President Johnson was quoted as telling the Cabinet that there are entirely too many interagency committees. Rep. Ullman stated that he is particularly concerned with the proliferation of interagency activity in the field of natural resource administration. He suggested to the President and the Members of the Congress that the solution would be a Resources and Conservation Council within the executive office of the President focusing its attention upon the integration, development, promotion, and utilization of our natural resources in the national interest. Inserted was the text of the "Statement of Al Ullman, U. S. Representative from the Second District of Oregon, with reference to H. R. 4430, Feb. 24, 1965," which discusses such a Council.

SALMON: Congressman Thomas M. Pelly inserted in Congressional Record, Mar. 24, 1965 (pp. A1382-A1383) excerpt from the Fishermen's News, on North Pacific high-seas fishing for red salmon by the Japanese.

PESTICIDES STANDARDS OF NONPERSISTENCE: H. R. 6186 (Yates) introduced in House Mar. 11, 1965, to require certain standards of nonpersistence of synthetic pesticides chemicals (economic poisons) manufactured in the United States or imported into the United States; to Committee on Interstate and Foreign Commerce.

SUPPLEMENTAL APPROPRIATIONS, FY 1965 (2nd): A communication (H. Doc. No. 111) from the President of

the United States, Mar. 15, 1965, transmitting a report indicating the necessity for supplemental estimates of appropriations for various departments for fiscal year 1965 and amendments to the request for appropriations transmitted in the budget for the fiscal year 1966; to Committee on Appropriations.

House Subcommittee on Appropriations for the Department of the Interior and Related Agencies held hearings Mar. 23, 1965, on supplemental estimates for the Fiscal Year 1965. Testimony was heard in support of the Bureau of Commercial Fisheries supplemental budget request for \$1,125,000 for "Construction," to repair flood damages to Bureau facilities and equipment in the Pacific Northwest. The Bureau of Sport Fisheries and Wildlife also requested an additional \$1,200,000 for "Construction."

Introduced in House Apr. 2, 1965, H. R. 7091, making supplemental appropriations for fiscal year 1965. House Committee on Appropriations reported (H. Rept. 224) bill on same day to House; to Committee of the Whole House on the State of the Union.

TECHNOLOGICAL LABORATORY LAND IN MARYLAND: Introduced in House, H. R. 5996 (Falcon) and H. R. 6013 (Machen) Mar. 9, and H. R. 6259 (Sickles) Mar. 15, 1965, to provide for the conveyance of certain real property of the United States to the State of Maryland; to Committee on Interior and Insular Affairs. Property affected includes the site of the Bureau of Commercial Fisheries Technological Laboratory, College Park, Md. Contains an authorization of funds to move Department of the Interior facilities as recommended by the Department at hearings held on a similar proposal during the 88th Congress.

WATER POLLUTION CONTROL ACT: Federal Installations, Facilities and Equipment Pollution Control Act: Hearings before a Special Subcommittee on Air and Water Pollution of the Committee on Public Works, United States Senate, 89th Congress, 1st session, on S. 560 (a bill to amend the Federal Water Pollution Control Act, as amended, and the Clean Air Act, as amended, to provide for improved cooperation by Federal Agencies to control water and Air Pollution from Federal Installations and Facilities and to control Automotive Vehicle Air Pollution), Feb. 23, 24, and 26, 1965, 176 pp., printed. Contains departmental reports, statements and communications of Federal, state officials, associations, and other organizations.

Special Subcommittee on Air and Water Pollution of Senate Committee on Public Works met in executive session Mar. 17, on S. 560. Mar. 19, the Subcommittee approved the bill for full Committee consideration. Senate Committee on Public Works same day favorably reported with amendments S. 560. Same Committee Mar. 22, submitted a report (S. Rept. 128) with amendments on S. 560.

S. Rept. 128, Federal Installations, Facilities, and Equipment Control Act (Mar. 22, 1965, report from the Committee on Public Works, U. S. Senate, 89th Congress, 1st session, to accompany S. 560), 15 pp., printed. Committee reported bill favorably with amendments and recommended passage. Contains purpose, need for legislation, major provisions, and changes in existing law.

Senate, Mar. 25, with committee amendments, passed S. 560; motion to reconsider passage was tabled. House Mar. 26, received S. 560 for concurrence; to Committee on Public Works.

WATER POLLUTION CONTROL ADMINISTRATION: H. R. 6077 and H. R. 6078 (both by William D. Ford) introduced in House Mar. 10, 1965, to amend the Federal Water Pollution Control Act, as amended, to establish the Federal Water Pollution Control Administration, to provide grants for research and development, etc.; to Committee on Public Works. Similar to other bills.

House Committee, Mar. 17, in executive session, continued consideration of H. R. 3988; hearings continued Mar. 18. Committee, same date, in executive session ordered reported favorably to the House S. 4 (amended). Committee Mar. 31, 1965, filed report (H. Rept. 215) with amendment on S. 4; to Committee of the Whole House on the State of the Union. (S. 4 had passed Senate Jan. 28, 1965.)

Sen. Muskie regarding the passage by the Senate of S. 4, inserted in Congressional Record, Apr. 1, 1965 (pp. 6312-6314) a paper ("What is Pollution--to A Conservationist?") by Richard H. Stroud, executive vice president of the Sports Fishing Institute, delivered Mar. 8, 1965, to the American Society of Civil Engineers at Mobile, Ala. Sen. Muskie pointed out that the version of S. 4 reported out by the House Committee does not contain the section pertaining to water quality standards.

WATER POLLUTION OF GREAT LAKES: Sen. Young of Ohio, in Congressional Record, Mar. 29, 1965 (pp. 6002-6003) remarked in the Senate that pollution of the Great Lakes is becoming an increasingly serious problem. He stated that, among other things, the commercial fishing industry on the Great Lakes has already been greatly curtailed by the existing contamination and that there is a need for State-Federal action with provisions for enforcement.

WATER PROJECT RECREATION ACT: Subcommittee on Irrigation and Reclamation of House Committee on Interior and Insular Affairs met in executive session Mar. 10, 1965, on H. R. 5269, to provide uniform policies with respect to recreation, fish, and wildlife benefits and costs of Federal multiple-purpose water resource projects, and to provide the Secretary of the Interior with authority for recreation development of projects under his control; met and marked up bill Mar. 17; Mar. 18 ordered bill reported favorably to the full committee. Full committee met Mar. 23, 24, 31, and Apr. 2, on H. R. 5269. Apr. 1 Committee ordered bill favorably reported to the House.

Senate Committee on Interior and Insular Affairs Mar. 22-23, 1965, held hearings on S. 1229, to enhance recreational facilities at Federal water resource and related projects. Hearings adjourned subject to call. Met Mar. 25, 27, and 30, and Apr. 1 Committee ordered favorably reported with amendments S. 1229.

WATER RESOURCES RESEARCH: Water Resources Research: Hearings before the Subcommittee on Irrigation and Reclamation of the Committee on Interior and Insular Affairs, United States Senate, 89th Congress, 1st session, on S. 22 (a bill to promote a more adequate national program of water research), Mar. 2 and 3, 1965, 81 pp., printed. Includes departmental reports, statements and communications from senators, research centers, universities, and associations.

Introduced in House H. R. 5930 (Hanley) Mar. 8, 1965 and H. R. 6282 (Pickle) Mar. 15, to promote a more adequate national program of water research; to Committee on Interior and Insular Affairs.

Irrigation and Reclamation Subcommittee of Senate Committee on Interior and Insular Affairs Mar. 16, in executive session approved S. 22. Full committee Mar. 19, favorably reported with amendment S. 22. Same Committee Mar. 22, submitted a report (S. Rept. 127) on S. 22.

S. Rept. 127, Water Resources Research Act (Mar. 22, 1965, report from the Committee on Interior and Insular Affairs, U. S. Senate, 89th Congress, 1st session, to accompany S. 22), 18 pp., printed. Committee after comprehensive hearings reported bill favorably and recommended passage. Discusses purpose, background, research needs, categories of water resources research, broad-scale participation essential, committee recommendation, changes in existing law, Executive Agency reports, and as an appendix the statement by President Johnson upon signing S. 2, 88th Congress, into law (P. L. 88-379), the Water Resources Research Act of 1964.

Senate Mar. 25 passed, with committee amendment, S. 22. Motion to reconsider passage was tabled. House Mar. 26 received S. 22 for concurrence; to Committee on Interior and Insular Affairs.

WATER RESOURCES PLANNING ACT: House Committee on Interior and Insular Affairs, Mar. 15, 1965, reported to House H. R. 1111, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, etc.; with amendments (H. Rept. No. 169); referred to Committee of the Whole House on the State of the Union.

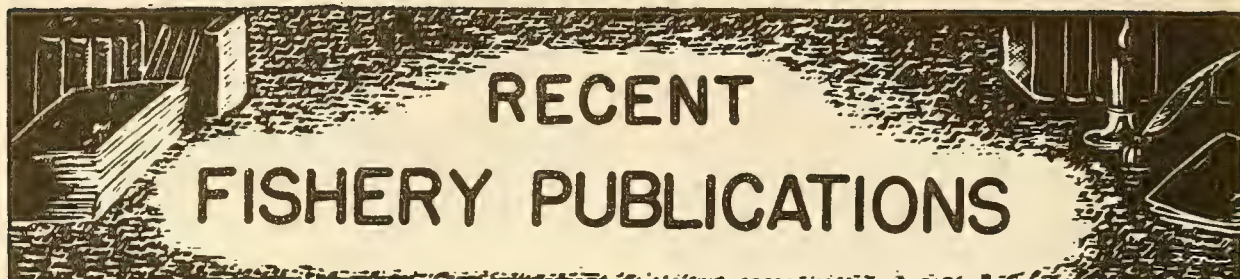
H. Rept. 169, Water Resources Planning Act (Mar. 15, 1965, report from the Committee on Interior and Insular Affairs, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 1111), 22 pp., printed. Committee reported bill favorably with amendments, and recommended passage. Contains purpose, need for legislation, background, cost, committee amendments, section-by-section analysis, and Executive Agency reports.

H. R. 6830 (Helstoski) introduced in House Mar. 26, 1965, to Committee on Interior and Insular Affairs; similar to H. R. 1111.

By a unanimous record vote the House Mar. 31, 1965, passed H. R. 1111. This passage was subsequently vacated and S. 21 (passed Senate Feb. 25, 1965), a similar bill, was passed in lieu after being amended to contain the House-passed language. In addition to several committee amendments, the House adopted two perfecting amendments.

Note: The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va. 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.





FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number | Title |
|----------|---|
| CFS-3704 | - Gulf Coast Shrimp Data, October 1964, 20 pp. |
| CFS-3710 | - Frozen Fishery Products, December 1964, 8 pp. |
| CFS-3712 | - Georgia Landings, November 1964, 3 pp. |
| CFS-3714 | - California Landings, September 1964, 4 pp. |
| CFS-3715 | - Michigan, Ohio & Wisconsin Landings, October 1964, 4 pp. |
| CFS-3717 | - South Carolina Landings, November 1964, 3 pp. |
| CFS-3720 | - New Jersey Landings, November 1964, 3 pp. |
| CFS-3721 | - Manufactured Fishery Products, 1963 Annual Summary, 9 pp. |
| CFS-3722 | - New York Landings, November 1964, 5 pp. |
| CFS-3723 | - Mississippi Landings, October 1964, 3 pp. |
| CFS-3724 | - Virginia Landings, November 1964, 4 pp. |
| CFS-3725 | - Fish Meal and Oil, November 1964, 2 pp. |
| CFS-3726 | - Mississippi River Fisheries, 1963 Annual Summary, 9 pp. |
| CFS-3727 | - United States Fisheries, 1963 Annual Summary, 17 pp. |
| CFS-3729 | - Louisiana Landings, November 1964, 3 pp. |
| CFS-3730 | - Alabama Landings, November 1964, 3 pp. |
| CFS-3731 | - Maine Landings, November 1964, 4 pp. |
| CFS-3733 | - South Carolina Landings, December 1964, 3 pp. |
| CFS-3734 | - Georgia Landings, December 1964, 3 pp. |
| CFS-3735 | - California Landings, October 1964, 4 pp. |
| CFS-3736 | - Florida Landings, December 1964, 8 pp. |
| CFS-3737 | - Fish Meal and Oil, December 1964, 2 pp. |
| CFS-3744 | - Gulf Coast Shrimp Data, November 1964, 21 pp. |

Sep. No. 730 - Exploratory Fishing for Spiny Lobsters, Sand Lobsters, and Scallops in Panama.

Sep. No. 731 - On-The-Job Training Program for Trainee Commercial Fishermen.

SSR-Fish. No. 489 - Pelagic Fur Seal Investigations, Alaska, 1963, by Clifford H. Fiscus, Gary A. Baines, and Hiroshi Kajimura, 36 pp., illus., Jan. 1965.

SSR-Fish. No. 496 - History of Oceanography in the Offshore Waters of the Gulf of Maine, by John B. Colton, Jr., 20 pp., illus., Dec. 1964.

SSR-Fish. No. 497 - Fur Seal Investigations, Pribilof Islands, Alaska, 1963, by Alton Y. Roppel, Ancel M. Johnson, and Douglas G. Chapman, 64 pp., illus., Jan. 1965.

SSR-Fish. No. 498 - Observations of Cetaceans off California, Oregon, and Washington, by Clifford H. Fiscus and Karl Niggel, 30 pp., illus., Jan. 1965.

SSR-Fish. No. 502 - Fur Seal Investigations Pribilof Islands, Alaska, 1964, by Alton Y. Roppel and others, 50 pp., illus., Jan. 1965. Discusses population and related studies on fur seals on the Pribilof Islands sealing grounds during 1964. Presents information on male seal age classification and bull counts; female age classification and reproduction; tag recoveries, tagging of pups, and tag survey of yearlings; seal mortality; population estimates of pups from the recovery of tagged males and females, of yearling males of 1961 year-class, from sampling live pups, and from counting pups on four rookeries; and seal-pup weights. Presents statistical data on kill of male seals, by year-class, 1947-62; kill of female seals, by year-class, 1939-63; records of fur seal pups tagged, 1941, 1945, 1947-49, and 1951-64; and related information. A total of 48,980 male and 16,452 female seals were killed on the Pribilof Islands in 1964. In all, 1,077 skins from males and females were collected for experimental use in relating economic value to age and sex. The predicted male kill as of Aug. 5, 1965, will be 4,000 ages 2 and 5, 33,000 age 3, and 16,000 age 4.

SSR-Fish. No. 503 - Automatic Data Processing Program for Marine Synoptic Radio Weather Reports, by James H. Johnson, Glenn A. Flittner, and Marvin W. Cline, 77 pp., illus., Feb. 1965.

Annual Report Exploratory Fishing and Gear Research, Bureau of Commercial Fisheries, Region 2, for Fiscal Year 1963 Ending June 30, 1963, by Harvey R. Bullis, Jr. and J. R. Thompson, Circular 193, 70 pp., illus., Dec. 1964. Part 1 discusses history of exploratory fishing and gear research work at the U. S. Bureau of Commercial Fisheries' stations at Pascagoula, Miss., Brunswick, Ga., and Panama City, Fla.; nature and function of projects in exploratory sampling devices, sampling patterns in fishery exploration, bases for quantitative estimates of animal abun-

dance and availability, and exploratory follow-through and fishery developments; exploratory collections and cooperative work; and role of exploratory fishing and gear research in education. Part 2 covers accomplishments of the Gulf of Mexico exploratory fishing and gear research program at Pascagoula, Miss.; the Caribbean and Tropical Atlantic exploratory fishing and gear research program; the offshore shrimp gear research photoinstrumentation; South Atlantic exploratory fishing and gear research program; gear research and development program; and the BCF/AID spiny lobster exploratory fishing project, Republic of Panama.

Columbia River Fishery Program, 1963, Circular 192, 23 pp., illus., printed, Nov. 1964. Reviews the Columbia River fishery and work of the Columbia River Fishery Development Program through 1963. Discusses the history of the region's fishery resource; resource trends in chinook, sockeye, coho, and chum salmon, and summer and winter steelhead trout; and the habitat. Also covers the development program for hatcheries, stream improvement, screening of diversions, appraisal of project results, and operational studies; water resource investigations; fish facilities; and future of the Columbia River fishery.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-52	Menhaden Fish Oil Prices--New York City, New York, 1953-1964 and January 1965, 6 pp.
MNL-95	International Fishing Activities in Western and Southern Africa, 1964, 8 pp.
MNL-96	Frozen Fish Importers in France, 2 pp.
MNL-97	Thailand's Fisheries, 3 pp.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE REPORT IS AVAILABLE FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

Statistical Report on the Tuna Longline Fisheries by Fishing Grounds for 1963, Translation Series No. 13, 27 pp., processed, Sept. 1964. (Translated from the Japanese, Statistics and Survey Division, Economic Bureau, Ministry of Agriculture and Forestry, Tokyo, Japan, Sept. 1963.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fisheries, 1964, by V. J. Samson, 48 pp., illus., Feb. 1965. (Market News Service, U. S. Fish and Wildlife Service, Rm. 205, Post Office Bldg., San Pedro, Calif. 90731.) A review of 1964 trends and conditions in the California fisheries, including a summary of fishing seasons in major commercial fisheries during 1964 covering dates and catch quotas. Among the subjects covered are the tuna industry and cannery receipts; the domestic tuna fishery; American Tunaboat Association tuna auctions and ex-vessel prices; tuna prices and changes; the albacore fishery and ex-vessel price stability; reduction in number of tuna canneries by mergers; slight increase in canned tuna pack; imports of frozen tuna and canned tuna in brine; canned tuna prices held steady after early advance; construction of largest U. S. fishing vessel for tuna purse-seining and loss of 7 other vessels. Also covered are the sardine industry and its continued failure, canned sardine pack and prices; the mackerel fishery; anchovy fishery; canned pet

food pack; whaling industry; and fish meal prices and markets, 1961-64. Included in the statistical tables are data on tuna and tunalike fish--canners' receipts, domestic landings, frozen imported tuna, and canned pack, 1962-64; sardine landings, pack, and meal and oil produced, 1963/64 and 1964/65 seasons; and the canners' receipts and pack of mackerel and jack mackerel, 1962-64. Also contains data on canners' receipts of raw materials and production of anchovies, herring, pet food, and tuna and mackerel meal and oil; landings of fish and shellfish in the Eureka and San Pedro-Santa Monica areas; imports of fishery products into Arizona and California Customs Districts, 1963-64; and whale fishery, 1962-64. An attractive cover showing the new 167-foot steel tuna purse-seiner, City of Tacoma, enhances this year's report.

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, Jan. 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, Feb. 1965, 9 pp., illus. (U.S. Bureau of Commercial Fisheries, Tuna Resources Laboratory, P. O. Box 271, La Jolla, Calif. 92038.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

(Chicago) Monthly Summary of Chicago's Wholesale Market Fresh and Frozen Fishery Products Receipts, Prices, and Trends, Jan. 1965, 14 pp. (Market News Service, U. S. Fish and Wildlife Service, U. S. Customs House, 610 S. Canal St., Rm. 704, Chicago, Ill. 60607.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and weekly wholesale prices for fresh and frozen fishery products; for the month indicated.

Fishery Industrial Research, vol. 2, no. 3, Nov. 1964, 81 pp., illus., printed. (Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd., Seattle, Wash. 98102.) Contains articles on: "Free liquid content of Gulf oysters and suggested change in standards," by Arthur F. Novak, Ernest A. Fieger, and Joseph A. Liuzzo; "Comparison of chemical and sensory tests for assessing storage life of iced calico scallops," by Melvin E. Waters; "Cholesterol content of various species of shellfish. 1--Method of analysis and preliminary survey of variables," by Mary H. Thompson; "Evaluation of the micro-diffusion method for the determination of tertiary volatile base in marine products," by John Spinelli; "Preparation of chilled meat from Atlantic blue crab," by David H. B. Ulmer, Jr.; "Observations of the 'blueing' of king crab, *Paralithodes camtschatica*," by Newman S. Groninger and John A. Dassow; "Comparison of the picric acid turbidity and Nessler tests with subjective evaluations of quality of shrimp," by Mary E. Ambrose, Charles F. Lee, and Frank T. Piskur; and "Economic study of sea scallop production in the United States and Canada," by Richard M. Doherty and others.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, Jan. 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, solubles, and oil; fishery imports at Port Isabel and Brownsville, Tex., from Mexico; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Tex.; and sponge sales; for the month indicated.

Japanese Views on Whaling, by Lorry M. Nakatsu, 3 pp., illus., processed, Feb. 19, 1965 (Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, 101 Seaside Ave., Terminal Island, Calif. 90731.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, Jan. 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--Nov. 1965, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, Feb. 1965, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; shrimp landings; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

Techniques for Infrared Survey of Sea Temperature (Report of a Workshop Held at the U. S. Department of the Interior, Washington, D. C., April 27 and 28, 1964), Circular No. 202, 145 pp., illus., processed, Nov. 1964. (Sandy Hook Marine Laboratory, Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service, Highlands, N. J.)

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Employment Opportunities in the Bureau of Sport Fisheries & Wildlife, 20 pp., illus., printed, 1964, 30 cents. Discusses briefly the organization of the Bureau of Sport Fisheries and Wildlife and its major programs. A section on careers covers refuge manager, fishery biologist, wildlife biologist, fish hatchery manager, animal control biologist, mammal control agents (hunters), U. S. game management agent, aid-type positions, engineers, appointment, U. S. game management agent (pilot), salaries, qualifications, how to apply, location, transportation, quarters for employees, positions in Alaska, physical ability, opportunities in trades and crafts, and summer employment. A section on fringe benefits includes information on leave, retirement, group health benefits, group life insurance, incentive awards program, development, and uniforms and uniform allowance. Other sections cover opportunities in other agencies, preparing for a career in conservation work, and addresses of Bureau of Sport Fisheries and Wildlife field offices and Civil Service offices. Of interest primarily to young people in high school or college who are considering a career in conservation work.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AGAR-AGAR:

"Agar--its uses and potential in New Zealand," by L. B. Moore, article, Commercial Fishing, vol. 3, no. 5, Jan. 1965, pp. 23-24, 25, illus., printed. Trade Publications Ltd., 47 Lewis Eady Bldg., Queen St., Auckland, New Zealand. About 100 tons of dry seaweed (for the production of agar-agar) are produced annually in New Zealand. Agar-agar is used for growing laboratory cultures in hospitals and laboratories and as an additive in canned foods. The New Zealand industry developed during World War II when the supply from Japan, formerly the only agar-agar exporter, was cut off.

ANCHOVY:

Behavior and Natural Reactions of the Northern Anchovy, ENGRAULIS MORDAX Girard, under the Influence of Light of Different Wave Lengths and Intensities and Total Darkness, by Anatole S. Loukashkin and Norman Grant, 62 pp., illus., printed. (Reprinted from Proceedings of the California Academy of Sciences, Fourth Series, vol. 31, no. 24, Jan. 15, 1965, pp. 631-692.) Sardine Research Program, California Academy of Sciences, Golden Gate Park, San Francisco 18, Calif.

"Economic efficiency of the exploitation of the Black Sea anchovy for the production of feeding flour (fish flour) and oil," by L. S. Alpatikova, article, Trudy AzCherNIRO, vol. 21, 1961, pp. 63-73, printed in Russian. Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva, Moscow, U.S.S.R.

ARTIFICIAL HABITAT:

Housing Scheme for Fishes, by Yasuo Ohshima, No. 8, 56 pp., illus., printed in Japanese. Japan Fisheries

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Resource Conservation Association, Shiba Nishikubo Sakuragawa-cho, 24, Minato-ku, Tokyo, Japan.

ATHEROSCLEROSIS:

"Nutrition and atherosclerosis. Marine algae in atherosclerosis," by Iris Ilona Lieber, article, Chemical Abstracts, vol. 59, Sept. 30, 1963, Abstract No. 7915a, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

BELGIUM:

Market Factors in Belgium, by Robert H. Walker, OBR 64-142, 14 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Opportunities for U. S. exporters to boost sales to Belgium are numerous and should increase over the foreseeable future. In addition to market outlook, the report discusses the scope and nature of the market, commercial competition, market analysis for selected commodities, and a market profile for the country.

BRAZIL:

Sudene, Boletim de Estudos de Pesca, processed in Portuguese, Divisao de Documentacao, Setor de Intercambio e Aquisicao, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 9^a Andar, Recife, Pernambuco, Brazil: vol. 3, nos. 9/10, Sept./Oct. 1963, 25 pp., illus. Includes, among others, these articles: "Conteudo estomacal e evolucao sexual dos atuns e especies afins" (Stomach contents and sexual development of tunas and related species), by Jose Bonifacio G. Fonseca and Silvio B. Moraes; and "Contribuicao ao estudo as variacoes de produtividade das pescarias de lagosta na costa oriental do nordeste Brasileiro e Flutuações na composicao dos desembarques na praia do Pina (Pe)" (Contribution to the study on the variations in productivity of the spiny lobster fisheries on the west coast of northeast Brazil and fluctuations in the composition of the catches on the Pina coast), by Soloncy J. C. de Moura. vol. 3, nos. 11/12, Nov./Dec. 1963, 35 pp., illus. Contains, among others, these articles: "Observaciones colhidos em nucleos pesqueiros de Alagoas, Sergipe e Bahia" (Collected observations on the fisheries centers of Alagoas, Sergipe, and Bahia), by Bento F. Grangeiro; and "Variacoes sazonais na composicao biologica dos desembarques de lagostas" (Seasonal variations in the biological composition of the spiny lobster landings), by Petronio Alves Coelho. vol. 4, no. 1, Jan./Feb. 1964, 21 pp., illus. Contains, among others, these articles: "Determinacao de parametros biometricos em *Panulirus argus*" (Determination of length-weight relationships in *Panulirus argus*), by Gercilde de Amorim Borges; and "Divulgacoes tecnologicas do pescado" (Fishery technological reports), by Zeneudo Luna Machado.

CALIFORNIA:

California Fish and Game, vol. 51, no. 1, Jan. 1965, 64 pp., illus., printed, single copy 75 cents. Office of Procurement, Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. Includes, among others, articles on: "The animal food fishery in California, 1961-1962," by R. J. Nitsos and Paul H. Reed; and "The southern California mackerel fishery and age

composition of the Pacific mackerel catch for the 1959-60 and 1960-61 seasons," by Harold Hyatt.

CAMBODIA:

Foreign Trade Regulations of Cambodia, by Nandor J. Cheplo, OBR 65-2, 8 pp., printed, Jan. 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Cambodian Government maintains strict control over foreign trade as a means of protecting its balance of payments and encouraging local production. In addition to trade policy, the report discusses Cambodia's import tariff system, shipping documents, marking and labeling requirements, and special customs provisions. Also covers nontariff import controls, Cambodia's export controls, sales and other internal taxes, United States foreign trade controls, and Government representation between that country and the United States.

CANADA:

British Columbia Catch Statistics, 1964 (by Area and Type of Gear), 206 pp., illus., processed, Feb. 5, 1965. Economics Branch, Department of Fisheries of Canada, 1155 Robson St., Vancouver 5, B. C., Canada. The fourteenth annual report of catch statistics for British Columbia based on Departmental copies of sales slips that are completed by all commercial fish buyers operating within the Province. The report is divided into three sections: (1) summary of landings by district and total landed value of all fish; (2) highlights of catch statistics--a general review of significant events in the salmon fishery and a review for other species; and (3) detailed district and area monthly statistics by type of gear. For the first time, landings of halibut at U. S. ports by Canadian fishermen are included in the summary and also in the catch from the different areas.

Rapport sur les Pecheries du Quebec pour l'Exercice Financier 1963/1964 (Report on the Fisheries of Quebec for the Financial Year 1963/1964), 97 pp., illus., printed in French. Ministry of Industry and Commerce, Government House, Quebec, Canada.

The following are available from the Queen's Printer and Controller of Stationery, Ottawa, Canada.:

Biological Station, London, Ont., 9 pp., illus., printed. (Reprinted from Fisheries Research Board of Canada Annual Report 1962-63, pp. 65-73.)

Fisheries Statistics, Saskatchewan, 1963, Catalogue No. 24-211, 9 pp., processed in French and English, Jan. 1965, 50 Canadian cents. Contains data on the value of fish landed in Saskatchewan, 1956-63; quantity and value of landings by species, 1962-63; quantity and value of landings by major species and by lakes; capital equipment in primary fisheries operations; and number of persons engaged in the primary fisheries.

Fishes Occurring in the Fresh Waters of Insular Newfoundland, by W. B. Scott and E. J. Crossman, printed, 1964, C\$3.

CARP:

"Food of carp and wild carp during their breeding in the Kuban estuaries," by E. P. Teplova, article,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Trudy AzNIIRKh, vol. 6, 1963, pp. 163-177, printed in Russian. Azovskii Nauchno-Issledovatel'skii Institut Rybnogo Khozyaistva, Moscow, U.S.S.R.

"Raising 1-year-old carp for sale at Kuban," by S. Strel'nikov, article, Rybovodstvo i Rybolovstvo, no. 1, 1964, pp. 16-18, printed in Russian. Rybovodstvo i Rybolovstvo, Ministerstvo Sel'skogo Khozyaistva SSSR, Moscow, U.S.S.R.

The following articles are from Rybnoe Khozyaistvo Vnutrennykh Vodoemov Latv. SSR, vol. 7, 1963. Trudy Instituta Biologii Akademii Nauk Latv. SSR, Riga, Latvia.:

"Growth of commercial carp fishes in various types of lakes of the Latvian S.S.R.," by M. K. Kundzin'sh, pp. 233-235.

"Importance of natural and artificial food in raising carp yearlings," by V. S. Kirpichnikov, pp. 339-346.

CHILE:

Basic Data on the Economy of Chile, by Richard Kennedy and Mildred P. Burr, OBR 64-138, 24 pp., illus., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) While serious economic problems beset the new administration, in late 1964 there were developments that offered prospects for some improvement in the future course of the economy. The report discusses general information on the geography and climate, population, and government; structure of the economy; industrial sectors; and the labor force. Also covers Chile's financial organization, foreign trade, Government role in the economy, and outlook for the economy. According to a section on the fisheries, the dynamic growth of the fish reduction industry of the north has made fisheries an increasingly important factor in Chile's economy. However, the interest of both Government and private capital now seems to be shifting to processing of fish for human consumption--frozen, canned, salted, and smoked.

CLAMS:

"Condition of the Quahog, *Mercenaria mercenaria*, from polluted and unpolluted waters," by R. A. Cooper, S. B. Chenoweth, and N. Marshall, article, Chesapeake Science, vol. 5, no. 5, winter 1964, pp. 155-160, illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

"R. I. quahoggers make a living despite handraking methods," by Andreas A. Holmsen, article, Maritimes, vol. 9, no. 1, winter 1965, pp. 4-6, illus., printed. Maritimes, Davis Hall, Kingston, R. I. As part of a larger study on the economics of the quahog industry, the Department of Food and Resource Economics at the University of Rhode Island has studied the characteristics of the labor force in handraking. Over 92 percent of the commercial quahog harvest in Rhode Island is taken by handrakers using bullrakes and tongs, since most of the State's waters are closed to dredge boats by legislation. During the license year 1962/63, 872 people took out a commercial handraker's license; yet only

168 persons could be classified as full-time handrakers. An average net return of \$2.84 an hour for full-time handrakers compares favorably with the gross hourly earnings of manufacturing production workers in that State who earned \$2.02.

COD:

Distribution of Cod Catches by Commercial Vessels in the Gulf of St. Lawrence, 1960-1962, by Marcel Moussette, F. D. McCracken, and Alexandre Marcotte, General Series Circular No. 44, 15 pp., illus., processed, Jan. 1965. Biological Station, Fisheries Research Board of Canada, St. Andrews, N. B. Canada.

COMPOSITION:

"Investigations on the technological and nutrient properties of Atlantic fishes," by Z. A. Yakovleva, article, Trudy AzCherNIRO, vol. 21, 1961, pp. 46-50, printed in Russian. Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, U.S.S.R.

CRABS:

"Proximate composition, sodium, and potassium of Dungeness crab," by Richard W. Nelson and Claude E. Thurston, article, Journal of the American Dietetic Association, vol. 45, July 1964, pp. 41-43, printed. American Dietetic Association, 620 N. Michigan Ave., Chicago 11, Ill.

DENMARK:

"Danmarks fiskekonservesindustri 1963-64" (Denmark's fish canning industry 1963-64), article, Konserver & Dybfrost, vol. 22, no. 8, 1964, pp. 99-100, printed in Danish. Teknisk Forlag, Skelbaekgade 4, Copenhagen V, Denmark.

The following are from Dansk Fiskeritidende, vol. 83, 1965. Dansk Fiskeritidende, Studiestraede 3, 2, Copenhagen K, Denmark.:

"Fisk for 8 millioner kr. landet i Stranby i 1964" (Fish worth 8 million kroner landed in Stranby in 1964), no. 5, Jan. 29, p. 57.

"Fisk for 139 mill. kr. landet i Skagen i 1964" (Fish worth 139 million kroner landed in Skagen in 1964), no. 6, Feb. 5, p. 67.

EXPLORATORY FISHING:

"Experimental catch of fish by whaling vessels," by S. S. Vinnov, article, Trudy AzCherNIRO, vol. 21, 1961, pp. 18-29, printed in Russian. Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, U.S.S.R.

FISH COOKERY:

Florida Fish Recipes, 16 pp., illus., printed. Southeastern Fisheries Association, Inc., 330 So. Adams, Tallahassee, Fla. Illustrated with full-color photo prints and pen-and-ink drawings, this most attractive and appetite-appealing booklet presents 22 new recipes developed and tested by U. S. Bureau of Commercial Fisheries Home Economists. All prepared from fish or shellfish landed in Florida, the recipes include sumptuous broiled fillets, shrimp Miami, grilled spiny lobster tails, festive mullet, marinated Spanish mackerel fillets, mullett chowder, deviled crab, oyster club sandwiches, Florida crab boil, southern catfish stew, and shrimp macaroni salad. Also included

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are red snapper Floridian, mullet tomato fan-tans, shrimp paradise salad, shrimp tropicana, party shrimp with avocado dip, oriental king mackerel steaks, spicy red snapper, baked red snapper with sour cream stuffing, tomatoes with crab meat dressing, lobster Cantonese, and grouper Parmesan.

FISH CULTURE:

"Combined rice-fish culture," by F. Sukhoverkhov, article, Rybovodstvo i Rybolovstvo, no. 1, 1964, pp. 3-6, printed in Russian. Rybovodstvo i Rybolovstvo, Ministerstvo Sel'skogo Khoziaistva SSSR, Moscow, U.S.S.R.

"Japan--yellow tail and prawns," by Ian Richardson, article, World Fishing, vol. 13, Sept. 1964, pp. 41, 42, printed. John Trundell & Partners, Ltd., St. Richard's House, Eversholt St., London NW1, England. Japanese fishermen catch the largest quantity of fish in the open sea of any nation in the world, yet the Japanese are making considerable efforts to supplement the natural stocks of fish. In the Inland Sea, the Government has provided artificial shelters in the form of concrete blocks; seaweed has been planted; and artificial reefs have been formed in the belief that these procedures will offer some protection to the fish and that it will result in an increase in the fish stock. In conjunction with private enterprise, the Government has established a sea fish cultivation center in the Inland Sea with the express purpose of hatching fish for liberation into open waters or for further cultivation on marine fish farms. The yellowtail, similar to a horse mackerel, is caught in open water in the spring when it is about 2½ inches long. The small fish are held in net cages until they are large enough to be liberated into larger fish ponds. In less than a year they will have reached market size. The shrimp, Penaeus japonicus, are reared commercially to about 25 grams. The problem in regard to shrimp culture is how to keep the adults in captivity in order to provide the required egg stock. Until this is possible, the egg-bearing females will have to be caught in the open sea.

FISH FARMING:

"Fish farming in temperate waters," by C. E. Lucas and B. B. Rae, article, Scottish Fisheries Bulletin, no. 22, Dec. 1964, pp. 5-9, printed. Marine Laboratory, Department of Agriculture and Fisheries for Scotland, P. O. Box 101, Victoria Rd., Torry, Aberdeen, Scotland.

FISH MEAL:

"Fishmeal plant development," article, World Fishing, vol. 13, Aug. 1964, pp. 51-52, 55, printed. John Trundell & Partners Ltd., St. Richard's House, Eversholt St., London NW1, England.

FISH PORTIONS:

"Design production for flexibility and QC," by John V. Ziembra, article, Food Engineering, vol. 36, July 1964, pp. 64-67, illus., printed. Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa. Blocks of fish are cut into strips by a high-powered band saw. Strips proceed through multiple rotary cutters, and the sized portions then travel through batter and breading machines. Portions move directly through tunnel freezer or to continuous deep-fat fryer. Fro-

zen portions are finally carton-packed or sent to storage.

FOOD AND AGRICULTURE ORGANIZATION:

Report on the IPFC Symposium on Increasing Fish Consumption by Improving Handling and Distribution, 11th Session, Kuala Lumpur, Malaysia, 16th-31st October 1964, IPFC/C64/WP42, 15 pp., processed. Indo-Pacific Fisheries Council, FAO Regional Office for Asia and the Far East, Bangkok, Thailand.

FOREIGN AID:

"In which Cooley loans are discussed--somewhat," by Arthur P. McDermott, article, International Commerce, vol. 71, no. 9, March 1, 1965, p. 15, printed, single copy 35 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Describes, in a humorous vein, the operation of the Cooley Loan Program. The Administration for International Development (AID) sets aside a portion of the foreign currencies it receives in payment for our Food for Peace shipments. Any U. S. firm, or its branch, affiliate or subsidiary is eligible for a loan, as long as it is used to promote business or trade in the country where the funds originated. Since most of these are developing countries, manufacturing projects that would contribute to economic growth are preferred, but there are no formal requirements or restrictions. Early in February 1965 AID had the equivalent of \$112 million in the currencies of 23 nations available for loans to businessmen. Since the program began in 1954, 265 loans for the equivalent of \$213 million have been made. Most Cooley loans have been used for working capital, purchase of land, construction costs, and to pay for local goods and services.

FOREIGN TRADE:

Foreign Commerce Handbook: Basic Information and a Guide to Sources, 177 pp., printed (15th Edition), 1964, \$2. Chamber of Commerce of the United States, 1615 H St. NW., Washington, D. C. 20006. Presents references to sources of information and foreign trade services available from U. S. Government, international intergovernmental, international business, and U. S. business organizations. Also provides briefs on major subjects of particular interest to foreign traders such as advertising abroad, banks in foreign trade, U. S. export control, and tariffs of foreign countries. Includes a bibliography of pertinent reference works, books, pamphlets, and periodicals, with listings of selected organizations and their addresses, such as foreign and domestic chambers of Commerce, foreign Embassies and Legations and World Trade Clubs in the U. S., and Department of Commerce Field Offices.

FREEZE-DRYING:

"Storage of food dehydrated by freeze-drying. II--Deterioration of freeze-dried plaice (Paralichthys olivaceus) during storage," by Masakichi Kurogi and Susumu Kimura, article, Chemical Abstracts, vol. 59, Dec. 23, 1963, Abstract No. 15862d, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

FREEZING:

"Freezing at sea. I--Some thoughts on technical and economic aspects," by G. C. Eddie, article, Norwegian Fishing and Maritime News, vol. 11, no. 4, 1964, pp. 11, 13, 15, 29, 31, printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway. Paper presented at the OECD Meeting on Fish Technology, 14-17 Sept. 1964, Scheveningen. Purpose of this paper is to introduce the subject of freezing at sea and to prepare the way for a general discussion of the economic and technical aspects. Presents information on organization and policy--form and quality of product, organization of the market, and technical policy and economic consequences; and ship design, costs, and earnings. Some advantages of freezing at sea are low freezing equipment maintenance costs, economies in fuel use effected by slower speeds, and proportionately larger storage space available in larger trawlers.

FROZEN FISH:

"Time-temperature tolerance of frozen seafoods. I--Review of some of the recent literature on the storage life of frozen fishery products," by J. Perry Lane, article, Food Technology, vol. 18, July 1964, pp. 156-162, printed. The Garrard Press, 510 N. Hickory, Champaign, Ill.

GENERAL:

Information Letter, no. 2006, Feb. 10, 1965 (Convention Issue), 71 pp., illus., printed, limited distribution. National Cannery Association, 1133 20th St. NW., Washington, D. C. Includes the report on the symposium, "Three views of the American fishing industry" consisting of these articles: "The conservation of our coastal fishery resources," by E. L. Bartlett; "Some U. S. international fishery problems and international rules dealing with fisheries," by William C. Herrington; and "The American fishing industry--1964," by Donald L. McKernan. Also contains, among others, a symposium on "Food laws and regulations, present and future" consisting of articles on: "Uniformity of food laws and regulations--today and tomorrow," by J. L. Littlefield; "FDA standards, research and pesticide programs," by Lowrie M. Beacham, Jr.; and "FDA inspection and voluntary compliance programs--their relationship to industry," by Franklin D. Clark.

GREECE:

Market Factors in Greece, by John J. Eddy, OBR 65-5, 8 pp., printed, Jan. 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) In addition to market outlook in Greece, the report discusses the scope and nature of the market, commercial competition, market analysis for selected commodities, and a market profile for the country.

HALIBUT:

Halibut--Treasure of the Deep, 30-minute color film. Executive Secretary, Halibut Association of North America, 66 Marion St., Seattle, Wash. 98104. Pictures halibut fishing in the cold waters of the North Pacific. In contrast to the rough and hazardous life aboard a halibut vessel, other scenes portray the serving of halibut steaks in a restaurant. The film

also shows various ways of preparing and serving halibut at home; in the dining room as well as at a cook-out. The versatility of halibut cookery and ease of preparation are emphasized. The film is available free for television programs, and for showing before women's clubs, home economics classes, and other school and college groups.

HERRING:

"Biology of the herring, Clupea harengus membras (L.) in the Aral Sea," by N. E. Bykov, article, Sbornik Rabot po Ikhtiologii i Gidrobiologii, vol. 3, 1961, pp. 185-196, printed in Russian. Institut Ikhtiologii i Rybnogo Khozyaistva, Akademiya Nauk, Kazakh SSR, Alma Ata, Kazakh SSR.

"Serology of Atlantic Clupeoid fishes," by C. J. Sindermann, article, American Naturalist, vol. 46, no. 889, pp. 225-231, printed. The Science Press, Lancaster, Pa.

"Tilraunir med síldardaelu og síldarflutninga" (Experiment with loading and unloading herring), by Harald Asgeirsson and Hjalta Einarsson, article, Aegir, vol. 57, no. 22, Dec. 15, 1964, pp. 439-446, illus., printed in Icelandic. Aegir, Fiskifelag Islands, Reykjavik, Iceland.

INDIA:

Annual Report of the Department of Fisheries, Maharashtra State, Bombay, for the Year 1961-62, 62 pp., illus., printed. Department of Fisheries, Maharashtra State, Bombay, India. Reviews accomplishments of the Maharashtra State Department of Fisheries during the year 1961/62 and highlights the principal events in the fisheries, including devastation caused by a cyclone and floods, and effects of a fish famine. Discusses the marine fisheries; provisions for the fishing industry contained in the Third Five-Year Plan; financial assistance to the fish trade; landings, navigation, and harbor facilities; and preservation, transport, and marketing. Also includes information on the fish curing yards, Taraporevala Aquarium and research, fisheries schools and training, cooperative societies and socio-economic development, freshwater fisheries, and technological section projects. Contains statistical data on trawler landings by month and type of fish; fresh fish shipments into Bombay; landings by Government of India deep-sea vessels; arrivals of fish at Greater Bombay markets; salt fish production; and financial statement on shark-liver oil manufacture.

INDONESIA:

Foreign Trade Regulations of Indonesia, by M. Virginia Webbert, OBR 65-3, 12 pp., printed, Jan. 1965, 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Indonesia's import controls are exercised primarily for balance-of-payments purposes. Export controls are applied mainly to insure surrender of exchange proceeds, but they also serve to avoid commodity shortages for domestic consumption. In addition to trade policy, the report discusses Indonesia's import tariff system, shipping documents, marking and labeling requirements, and special customs provisions. Also covers nontariff import controls, Indonesia's export controls,

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import surcharge, and additional levies; United States foreign trade controls, and Government representation between that country and the United States.

INTERNATIONAL COMMISSIONS:

(International North Pacific Fisheries Commission) Annual Report, 1961, 131 pp., illus., printed, 1964. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada. This is the eighth consecutive annual report of the activities and achievements of the International North Pacific Fisheries Commission, established by a Convention between Canada, Japan, and the United States on June 12, 1953, for the purpose of promoting and coordinating the necessary scientific studies and to recommend the required conservation measures in order to secure the maximum sustained productivity of fisheries of joint interest. The report contains summary accounts of the annual meeting of the Commission held in Tokyo, November 6-11, 1961; and a brief resume of administrative activities during the year. It also presents summaries prepared by the national research agencies of investigations which they carry out under the planning and coordination of the Commission. Of principal concern are the salmon and king crab fisheries.

IRRADIATION PRESERVATION:

"Effects of radiopasteurization on fish and shellfish," by Kinjiro Yamada, article, Chemical Abstracts, vol. 60, May 11, 1964, Abstract No. 12581e, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

Food Preservation by Irradiation, by Grace M. Urrows, one of a Series on Understanding the Atom, 38 pp., illus., printed, Oct. 1964. U. S. Atomic Energy Commission, P. O. Box 62, Oak Ridge, Tenn. 37831. Presents information on the potential of irradiation and the world-wide interest in this process; preservation of man's food by drying, fermentation, canning, and freezing; how food spoils--food poisoning, botulism; and radiation--a new technique (ionizing radiation and how it works, research history, testing for wholesomeness, Government clearance, appearance and taste, and packaging). Also discusses testing programs and devices--AEC "family of irradiators," source selection, U. S. Army Radiation Laboratory, and the goal of commercial development; preserving the taste of the orchard; fruit-stand economics of the future; and total impact of food irradiation (nutritional knowledge increase); use of sterilized food in the civilian economy; and public acceptance. A chapter on fresh fish every day covers the radiation pasteurization of clams and haddock, crab meat, and shrimp. And a chapter on potential market for irradiated fish discusses changing distribution practices, cost factors, and ease of retail handling.

"L'irradiation des poissons" (Irradiation of fish), article, La Revue de la Conserve, vol. 18, no. 7, 1963, p. 340, printed in French. Societe d'Edition pour l'Alimentation, 1 Rue de la Reale, Paris I, France.

"Radiation preservation of New England seafoods," by Joseph W. Slavin, Maynard A. Steinberg, and Louis J. Ronsivalli, article, Isotopes and Radiation

Technology, vol. 1, no. 4, Summer 1964, Section II--Radiation Processing of Foods, pp. 317-322, illus., printed. U. S. Atomic Energy Commission, Washington, D. C. 20545. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

The following are from Radiation Pasteurization of Foods, TID 7684, 1963. Technical Information Division, U. S. Atomic Energy Commission, Washington, D. C. 20545.:

"Radiation pasteurization of Pacific crab and flounder," by D. Miyauchi, pp. 32-37.

"Study of the basic microbiological and biochemical factors involved in the irradiation preservation of marine products," by A. M. Dollar, pp. 98-104.

"Study of radiation pasteurized fishery products," by L. J. Ronsivalli and J. W. Slavin, pp. 20-27.

ISRAEL:

Selling in Israel, by Joseph D. McLaughlin, OBR 65-1, 8 pp., illus., printed, Jan. 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) United States-made products are building a reputation in Israel for reliability, versatility, quality, modernity, and ease of maintenance. The report explains the road to selling: representation; direct selling; import requirements; distribution practices; and transportation, port, and storage facilities. Also presents details on commercial practices; marketing aids; Government procurement; selling under United States programs; and helpful information for business travelers on currency, hotel accommodations, and climate.

KENYA:

Report on Kenya Fisheries, 1963, 34 pp., printed, 1964, 3s. (about US\$0.45). Ministry of Forest Development, Game and Fisheries, Fisheries Division, Nairobi, Kenya. Contains information on work accomplished in the inland fisheries of the Western Region; the Lake Victoria fisheries; the fisheries of Lakes Naivasha and Baringo; the trout hatchery; the trout fisheries; the Turkana fishery at Ferguson's Gulf, Lake Rudolf; and the fish culture farm. Also discusses the sea fisheries--North Coast-Kiunga, North Coast-Lamu, Malindi, South Coast, loans to fishermen, gear development--trawling experiments, turtles, the sedentary fisheries (shellfish), big game fishing, and the Coral Garden fish reserves. Included are statistical tables showing quantity and value of the Malindi fishery for demersal and pelagic species, sharks, spiny lobster, and other fish, 1958-63; earnings of 3 Lake Baringo fishermen in one week; imports and exports of fishery products, by type; estimated fish landings on the Kenya coast, 1956-63; results of Japanese shrimp trawling; the Lake Victoria fisheries; and total landings and ex-vessel value of fish in Kenya, 1963.

LAW OF THE SEA:

"A code of conduct for the fishing grounds," by Lawrence A. White, article, United States Naval Institute Proceedings, vol. 91, no. 3, March 1965, pp. 76-82, illus., printed, single copy 75 cents. United States

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Naval Institute, Annapolis, Md. Since there is as yet no control over much of the fishing activity on the high seas, there is growing concern not only for depletion of species but also for the number of incidents involving use of force by fishermen on each other. Internationally, there seems to be general understanding concerning the extent of a state's sovereignty over the territorial sea (at least up to a three-mile width) and what particular jurisdiction can be applied in the contiguous zone (at least up to 12 miles from baselines). There is even substantial agreement on a coastal state's rights in or on its continental shelf. In matters concerning fishing rights, however, substantial disagreement still exists. The most urgent problem seems to be the devising of a code of conduct to be applied by fishermen, regardless of their right to fish in an area. The question of fishing rights and quotas can only be answered by logical use of scientific facts concerning both conservation measures and national needs. Just as we have joined together in the United Nations for our common peace and security, we must unite to produce an orderly regime for the high seas, territorial seas, and related areas, asserts the author.

LOBSTERS:

Lobster Storage and Shipment, by D. W. McLeese and D. G. Wilder, Fisheries Research Board of Canada Bulletin No. 147, printed, 1964, C\$1.75. Queen's Printer, Ottawa, Canada.

MASSACHUSETTS:

The Massachusetts Marine Fisheries Advisory Commission, by Robert F. Hutton and Frederick C. Wilbour, Jr., Educational Series No. 1, 23 pp., illus., processed, 1964. Massachusetts Division of Marine Fisheries, 15 Ashburton Pl., Boston, Mass.

MULLET:

A Bibliography of Systematic References to the Grey Mullet (Mugilidae), by J. M. Thomson, Technical Paper No. 16, 128 pp., processed, 1964. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

NETS:

"Een beter garnalennet" (Better shrimp net), by R. Boddeke, article, *Visserij-Nieuws*, vol. 8, no. 1, Jan. 1965, pp. 2-8, illus., printed in Dutch, Directie der Visserijen, 1e van den Boschstraat 4, 's-Gravenhage, Netherlands. Describes a French-developed net for shrimp. The net strains out immature flat fish. It is expected that use of this type of net will permit intensive shrimp fishing without damage to flat fish stocks.

NEW JERSEY:

Annual Report of the Division of Fish and Game for the Fiscal Year Commencing July 1, 1963 and Ending June 30, 1964, 64 pp., illus., printed. New Jersey Department of Conservation and Economic Development, Trenton, N. J. 08625. Contains sections detailing work in administration, law enforcement, the Bureau of Wildlife Management, and the Bureau of Fisheries Management. The section on fisheries discusses activities of the Freshwater Research and Development Section in trout management and

research, warm-water fisheries research, warm-water management, pollution studies, and habitat improvement; the Marine Fisheries Research and Development Section; State fish hatcheries; and commercial fishing. Included are statistical data on hatchery fish distributed, raised, and on hand, 1964 season; landings from fish pounds, 1963; total New Jersey commercial catch; and stocking of New Jersey streams and lakes, Fiscal Year 1964.

NORWAY:

"Norwegian outfit in world fisheries," article, *Norwegian Fishing and Maritime News*, vol. 11, no. 4, 1964, pp. 7-8, printed. *Norwegian Fishing and Maritime News*, P. O. Box 740, Slottsgt. 3, Bergen, Norway. The Norwegian export of vessels, gear, equipment, processing machinery, and "know-how" for the fishing industry have shown quite a remarkable increase the last few years. Value of exports rose from £1.8 million in 1960 to £7.0 million in 1963 and were expected to reach £10 million in 1964. In 1963 Norway imported fishing equipment and gear with a total value of £9 million. Principal export markets are Iceland, Sweden, Denmark, Peru, Chile, and West Germany. Fishing vessels, representing 30 percent of the total exports, are being built in about 75 Norwegian yards. One firm is now delivering seven 231-foot stern trawlers with freezing facilities for Ghana, while another will soon launch a fleet of eight shrimp trawlers and a mothership for a Kuwaiti company. The Government has contributed considerably to fishery projects in the developing countries, where expanded fisheries are needed to meet the protein needs of a growing population.

NUCLEAR REACTORS:

Power Reactors in Small Packages, by William R. Corliss, one of a Series on Understanding the Atom, 28 pp., illus., printed, June 1964. U. S. Atomic Energy Commission, P. O. Box 62, Oak Ridge, Tenn. 37831.

OCEANOGRAPHY:

Abyss (The Deep Sea and the Creatures That Live In It), by C. P. Idyll, 414 pp., illus., printed, 1964, \$6.95. Thomas Y. Crowell Co., 201 Park Ave. S., New York, N. Y. 10003. Man has used the sea as a means of travel and a source of food for centuries, but it is only recently that he has come to realize that there is much more to it. This book describes the physical, chemical, and dynamic characteristics of the ocean waters and its boundaries which mold and influence all life in them. In spite of the fact that man has fished a small part of the sea and explored it in a tentative way, the deep sea that makes up nine-tenths of the water of the oceans is still a vast unknown. How this creates mystery is ably pointed out by the author: "The deep sea is pitch black, without the least glimmer of the sun's rays to give it cheer; it is cold, only a little above freezing; it is under enormous pressure, with power to crush to a shapeless mass any body not constructed to combat it; . . ." This is a general account of the deep sea for the non-scientist. The author tells us what is known about this vast unknown, but he also points out what is not known. After theorizing about the birth of the oceans, the author describes the land beneath the sea with its mountains higher than Everest, valleys deeper than the Grand Canyon, and its great submerged rivers.

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A good part of the book is devoted to the "grotesque and improbable" creatures of the deep sea, such as fish that are all mouth; the six-foot urn-shaped sponge; the South Sea worm that spawns precisely at the third-quarter of the November moon; the poisonous jellyfish; the brilliant scarlet shrimp; the hideous octopus and squid that squirt ink; the luminous angler that entices its prey with gleaming and flickering colored lights; and the fossil remnants of ancient life. All these would be unbelievable except that the more than 100 photographs and drawings show that some of the creatures are even more grotesque than we could imagine. Also covered are: sea monsters; how the environment of the deep sea (cold, darkness, pressure) molds the creatures that live there; the economic value of the deep sea as a source of food, power, minerals, and a weapon of national defense; and the future of oceanography. An appendix includes a classification of the animals mentioned in the book and a list of more books about the sea. To increase its usefulness, it has a good index. In the years to come, the sea will exert more influence on man. This book will be of value to anyone interested in gaining some understanding of that vast unknown--the deep sea.

-- J. Pileggi

International Indian Ocean Expedition Newsletter, India, vol. 2, no. 2, Sept. 1964, 28 pp., illus., printed. Indian National Committee on Oceanic Research, Council of Scientific and Industrial Research, New Delhi, India. Includes, among others, articles on: "Nehru and ocean research"; "Indian Programme: scientific cruises of INS Kistna"; "Indian Ocean Biological Centre, Ernakulam"; "International Meteorological Centre, Bombay"; "Third IOC session in Paris"; and "Second meeting of the IOBC Consultative Committee."

The Mine Defense Laboratory as an Oceanographic Center, Report No. RAD R244, 29 pp., printed, Oct. 1964. Navy Mine Defense Laboratory, Panama City, Fla. In spite of intense effort on strictly military problems, interesting observations have been made on natural phenomena, hypotheses and conjectures have arisen requiring theoretical solutions, and equipment for special purposes had to be designed and tested. As a result, data, analyses, and inventions of purely scientific value have been generated and become part of the literature of oceanography. This report documents the belief that sufficient contributions have been made to basic oceanography in the form of publications, papers presented at scientific meetings, technical notes, memoranda, and reports to warrant giving consideration to placing the Laboratory firmly on the list of the world's active and productive oceanographic centers.

Narrative Report: "Anton Bruun" Cruise 8, U. S. Program in Biology, International Indian Ocean Expedition, News Bulletin No. 10, 17 pp., illus., processed, Feb. 1965. Woods Hole Oceanographic Institution, Woods Hole, Mass.

Oceanographical Observations in the Indian Ocean in 1962, H. M. A. S. DIAMANTINA (Cruise Dm 1/62), Oceanographical Cruise Report No. 14, 131 pp., illus., processed, 1964. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Operational Notes on a Shipboard Computer, by Richard M. Morse and Robert M. O'Hagan, Oceanographic (Unpublished Manuscript), 11 pp., processed, Oct. 15, 1964. U. S. Coast Guard Oceanographic Unit, Washington, D. C. 20220.

Serial Atlas of the Marine Environment--Surface Circulation on the Continental Shelf Off Eastern North America between Newfoundland and Florida, by Dean F. Bumpus and Louis M. Lauzier, Folio 7, 15 pp., illus., printed, 1965, looseleaf \$5, bound \$8. Serial Atlas of the Marine Environment, American Geographical Society, Broadway at 156th St., New York, N. Y. 10032. Presents the nontidal drift at the ocean's surface on the continental shelf off eastern North America between Newfoundland and Florida as inferred from the results of all available drift-bottle data, 1948-62. Twelve charts, one for each month, exhibit the annual cycle of circulation. On the basis of a 30-foot rectangular grid, the charts show where drift bottles were released, the percentage recovery from each rectangle to the North American seaboard, and the velocity of the drift through those rectangles from which the bottles originated. Four final charts portray the surface circulation pattern on a seasonal basis.

A Study of Transmission of Weather and Oceanographic Data from Floating Weather Stations, by W. J. Fay, D. R. Munoz, and S. Weisbrod, Report No. 416, 56 pp., printed, Oct. 1964. Smyth Research Associates, San Diego, Calif.

The following are from Physical Aspects of Light in the Sea, edited by J. E. Tyler. University of Hawaii Press, Honolulu, Hawaii:

"Application of photography to observations in the sea," by H. E. Edgerton, pp. 31-35.

"Degeneration of image contrast and resolution in underwater photography," by A. May and P. H. Cords, Jr., pp. 25-29.

"On the instruments for measuring angular distributions of underwater daylight intensity," by T. Sasaki, pp. 19-24.

"Measurement at sea of water samples," by A. Ivanoff, pp. 11-17.

"Optical classification of ocean water," by N. G. Jerlov, pp. 45-49.

"An undersea observation vessel Kuroshio and its photographic apparatus," by N. Inoue and others, pp. 7-10.

OYSTERS:

"Bacteriological survey of an oyster bed in Tangier Sound, Maryland," by M. W. Vaughn and A. W. Jones, article, Chesapeake Science, vol. 5, no. 5, winter 1964, pp. 167-171, illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

Field and Laboratory Studies on Heat-Shock Method of Preparation of Oysters for Shucking, 27 pp., illus., processed, Nov. 1964. Gulf Coast Shellfish Sanitation

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Research Center, Division of Environmental Engineering and Food Protection, Public Health Service, U. S. Department of Health, Education, and Welfare, Dauphin Island, Ala. The heat-shock method of preparing oysters for shucking, as indicated by the results of this study, shows a definite trend in a reduction in the parameters which are normally used in assessing the bacterial quality of shellfish. Oysters that have been immersed at 140° F. for 5 minutes, at 150° F. for 3 minutes do not appear to be altered metabolically or physically to such an extent that the oyster could not be considered to be fresh. The use of 150° F. heat-shock temperature and an immersion time of not more than 3 minutes, with an immediate chill-down after removal from the immersion water, as a method of preparing oysters for shucking seems to offer no immediate public health problems over the normal cold shucking method. However, there appears to be a need for establishing sanitary control measures in the shucking bench area to prevent the holding of heat-shocked oysters for excessively long periods.

"Serological studies of species and races in oysters," by K. I. Numachi, article, *American Naturalist*, vol. 46, no. 889, pp. 211-217, printed, The Science Press, Lancaster, Pa.

PACIFIC OCEAN:

Proceedings of the Ninth Pacific Science Congress of the Pacific Science Association, Held at Chulalongkorn University, Bangkok, Thailand, November 18th to December 9th, 1957, Vol. 10--Fisheries, 100 pp., illus., printed 1961, Secretariat, Ninth Pacific Science Congress, Department of Science, Bangkok, Thailand. Includes, among others, articles on: "Report of the Chairman of the Standing Committee on Pacific Fisheries," by O. E. Sette; "A review on fisheries activities in Thailand for the period 1954 to 1957," by Thiemmedh Jinda; and "Summary report of the meeting of the Fisheries Division." Among the papers for the Symposium on Biology of Aquatic Animal Life with Special Reference to the Indo-Pacific Area is: "Flying fishes of the north-western Pacific," by N. V. Parin. Papers for the Symposium on New or Little Explored Aspects of Fishery Research include: "Some relationships within fish populations causing fluctuations in production," by H. S. Swingle; "Dimensions of albacore shoals in the Pacific Ocean," by Toshiro Kuroki; "Pacific salmon: ocean stocks and fishery developments," by Ferris Neave; "A hypothesis of the population biology of the sardine, *Sardinops caerulea*," by John C. Marr; and "On the biological basis of fishery in the western Pacific," by P. A. Moiseev. The Symposium on the Improvement and Management of Natural Inland Waters and Impounds Waters includes: "Some scientific aspects of fish culture in ponds," by G. A. Prowse; and "The public health significance of the recent outbreaks of poisonings by marine organisms in Japan," by Bruce W. Halstead, Toshiharu Kawabata, and Thomas F. Judefind.

PESTICIDES:

Pesticides in Soil and Water, an Annotated Bibliography, compiled by Richard E. Thomas, Jesse M. Cohen, and Thomas W. Bendixen, Public Health Service Publication No. 999-WP-17, 94 pp., printed, Sept. 1964. Engineering Section, Basic and Applied Sci-

ences Branch, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio 45226.

POLAND:

Polish Sea Fisheries Development, by Andrzej Niegolowski, 33 pp., printed, 1963. (Reprinted from *Polish Western Affairs*, vol. 4, no. 2, 1963.) Instytut Zachodni, Stary Rynek 2, Poznan, Poland. Part I discusses the world fisheries. The increasingly acute problem of feeding the world population has made into a paramount issue the utilization of the resources of the seas and oceans as a source of protein. A qualitative increase in the development of exploitation of the sea must in its final form lead to a change in the character of economic activity from a mere exploitation of sea resources, even if controlled and restricted by passive methods, to production in the form of farming of the sea. Sea fisheries, although producing markedly increased catches in the last few decades, have not developed at the same rate in all countries; their growth has varied according to region. There has been no increase in sea catch in Europe and North America; the increase has been shown mostly by countries of other continents. The lack of animal protein still occurring in many countries may be covered much more quickly and at a lower cost by the utilization of all the protein resources in the seas than by increasing livestock production. Part II details the fisheries development of Poland. Two main periods can be seen in the development of Polish sea fisheries after World War II: during the first, from 1945 to 1949, there was a need to put quickly into operation the destroyed technical base indispensable for landing fish. But even at that time preparatory work was started for the further development of sea fisheries. The second period was initiated on the basis of the Six Year Plan (1950-55) and the successive long-term plans. The rapid development of shipyards and industry made it possible to design and build a modern fishing fleet, while the investment in the fishing ports and the construction of the necessary auxiliary enterprises and processing plants created a technical base for expansion of the fishing industry, indispensable to the Polish economy as a whole. The long-term plan for the development of the Polish sea fisheries provides for a catch of about 900,000 tons of fish in 1980. This quantity will make it possible to raise the annual consumption of fish in Poland to 12-13 kg. (26.4-28.6 pounds) per capita, providing nourishment of full value and at medium cost.

Selected Articles, OTS 63-11402, 28 pp., illus., processed, 1964, 50 cents. (Translated from the Polish, *Roczniki Panstwowego Zakladu Higieny*, vol. 8, no. 5, 1957, pp. 481-493; vol. 10, no. 4, 1959, pp. 395-402; vol. 11, no. 4, 1960, pp. 329-334.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230. Includes articles on: "Tin and iron contents in some Polish canned fish" (O zawartosci cyny i zelaza w niektórych polskich konserwach rybnych), by Jozef Wierchowski and Maria Severin; "Control of fish processing stages. I--Herring in oil"; II--"Bullhead" in tomato sauce (Kontrola cyklow produkcyjnych w przetworstwie rybnym. I--Sledz w oleju; II--Byczki w pomidorach), by Jozef Wierchowski and others.

PROCESSING:

"Basis of new forms of wastes and losses in commercial fish processing," by N. I. Goremykina, article,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Trudy AzCherNIRO, vol. 21, 1961, pp. 29-31, printed in Russian. Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, U.S.S.R.

RESOURCE CONSERVATION:

Coastal Alterations, by Robert F. Hutton, Educational Series No. 2, 8 pp., processed, 1964, 5 cents. Massachusetts Division of Marine Fisheries, 15 Ashburton Pl., Boston, Mass.

SALMON:

"Distribution, growth, and food of young salmon in the rivers of the Latvian S. S. R.," by A. R. Mitans, article, Rybnoe Khozyaistvo Vnutrennykh Vodoemov Latv. SSR, vol. 7, 1963, pp. 309-317, printed in Russian. Trudy Institut Biologii Akademii Nauk Latv. SSR, Riga, Latvia.

"Nutrition of salmonoid fishes. XII--Isoleucine, leucine, valine and phenylalanine requirements of chinook salmon and interrelations between isoleucine and leucine for growth," by Ronald E. Chance, Edwin T. Mertz, and John E. Halver, article, Journal of Nutrition, vol. 83, July 1964, pp. 177-185, printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

Pacific Salmon in the Northern Waters--Species and Life-History, by Tomonari Matsushita, No. 6-1, 36 pp., illus., printed in Japanese. Japan Fisheries Conservation Association, Shiba Nishikubo Sakuragawa-cho, 24, Minato-ku, Tokyo, Japan.

"Pacific salmon survive in Atlantic," by J. J. Quigley, article, Trade News, vol. 17, no. 6-7, Dec. 1964-Jan. 1965, pp. 3-5, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. Noteworthy in 1964 was the return of Pacific salmon, offspring of pinks transplanted as eggs to a Newfoundland stream from British Columbia in 1962. The authentic returns occurred in St. Mary's Bay from 2.5 million eggs airlifted and transplanted in North Harbour River. Fresh-water survival from the first transplant was excellent, with a fry run of 87 percent. First indications that the mature fish were heading for the spawning grounds from which they had migrated came during the summer of 1964 when commercial fishermen reported strange fish in their catches which later proved to be pinks. Shortly after the captures in the commercial fishery the pinks began to show up in North Harbour River, and several "spents" were later recorded indicating successful spawning. Ultimate success in transplanting the pinks could well mean that in years to come Newfoundland fishermen will have available a species that plays an important part in the fisheries of British Columbia, a species that could take the pressure off the intensively fished Atlantic salmon.

Southeastern Alaska Pink Salmon Forecast Studies, Pre-Emergent Fry Program, by Theodore C. Hoffman, Informational Leaflet 47, 29 pp., illus., processed, Jan. 28, 1965. Department of Fish and Game, Subport Bldg., Juneau, Alaska.

SARDINES:

Life History of Japanese Sardine, SARDINOPS MELANOSTICTA (Temminck and Schlegel), and a Pro-

posed Methodology on the Investigations, by Keiichi Kondo, No. 5, 56 pp., illus., printed in Japanese. Japan Fisheries Resource Conservation Association, Shiba Nishikubo Sakuragawa-cho, 24, Minato-ku, Tokyo, Japan.

"A pesca de sardinha em 1964 e a modernizacao de frota" (The sardine fishery in 1964 and the modernization of the fleet), article, Jornal do Pescador, vol. 26, no. 310, Nov. 1964, single copy 5 escudos (about 20 U. S. cents). Junta Central das Casas dos Pescadores, Rua de S. Bento, 644-4^e Esq., Lisbon, Portugal.

"Technochemical properties of the Atlantic sardine and the causes of decrease in quality in commercial processing," by G. S. Khristoferzen and N. V. Timofieva, article, Trudy AzCherNIRO, vol. 21, 1961, pp. 40-46, printed in Russian. Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Moscow, U.S.S.R.

SAURY:

Biological Studies and Fisheries of the Saury, COLO-LABIS SAIRA (Brevoort), by Hideyuki Hotta, No. 4, 96 pp., illus., printed in Japanese. Japan Fisheries Resource Conservation Association, Shiba Nishikubo Sakuragawa-cho, 24, Minato-ku, Tokyo, Japan.

SCALLOPS:

The following, printed in Japanese, are available from the Japan Fisheries Resource Conservation Association, Shiba Nishikubo Sakuragawa-cho, 24, Minato-ku, Tokyo, Japan:

On the Scalping in Okhotsk Sea, by Shigemi Ito, No. 7, 40 pp., illus.

Studies on the Propagation of the Scallop, PATINOPEC-TEN YESSOENSIS (Jay), in Mutsu Bay, by Gotaro Yamamoto, No. 6, 80 pp., illus.

SEA LAMPREY:

Variability in Paper Electrophoretic Patterns of the Serum of Landlocked Sea Lamprey, PETROMYZON MARINUS Linnaeus, by M. L. H. Thomas and H. R. McCrimmon, 8 pp., illus., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 21, no. 2, 1964, pp. 239-246.) Queen's Printer and Controller of Stationery, Ottawa, Canada.

SHELLFISH:

"Cleaning up the shellfish," article, Maritimes, vol. 9, no. 1, winter 1965, pp. 10-12, illus., printed. Editor, Maritimes, Davis Hall, Kingston, R. I. The process of cleansing shellfish, called depuration, is a major subject of study at the Federal shellfish sanitation laboratory (the Northeast Research Center) which serves the east coast area from North Carolina to Maine. The depuration process may provide an important health-safety factor. The head of the laboratory explains that "We are obtaining biological data and developing engineering plans for a depuration facility. These plans can then be used by any group, public or private, interested in cleansing shellfish of pollution" Already the laboratory has collaborated with the States of Maine, Rhode Island, and New York in developing new and improving existing depuration facilities. "Even though we can cleanse shellfish of bacteria and, hopefully, of viruses, there remain other materials potentially dangerous to

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human beings which cannot readily be removed by present processes. These include pesticides, radioactive materials and heavy metals such as zinc and lead, and many other man-made and contributed pollutants. Further study must be made on the significance of these contaminants," states the laboratory head.

Stalking the Blue-Eyed Scallop, by Euell Gibbons, 345 pp., illus., printed, 1964, David McKay Company, Inc., 225 Park Ave., New York, N. Y. 10017. An amusing and informative book describing the author's adventures in hunting shellfish, inshore fish, and edible marine plants. Included are the biology, preparation for cooking, and recipes for oysters, quahogs, crabs, blue-eyed scallops, razor and surf clams, blue mussel, whelks, sea urchins, cockles, pen shells, abalone, limpets, chitons, wild goose barnacles, grunions, sharks, and blowfish, edible seaweeds, sour sorrel, beach plum, bayberry, lobsters, and octopus. "Surely the way to approach true communion with the sea is the grateful reception of this free gift of food that has never been gathered for gain or sold at a profit, preparing it with the loving care that lifts cooking from an irksome task to a fine art, then eating it with a reverent awareness, not only of its taste, texture, and aroma, but also its very nature and origin," asserts the author in his introductory chapter.

SHRIMP:

"Biology of shrimps acclimatized in the Aral Sea," by A. S. Malinovskaya, article, Sbornik Rabot po Ikhtiologii i Gidrobiologii, vol. 3, 1961, pp. 113-123, printed in Russian. Institut Ikhtiologii i Rybnogo Khozyaistva, Akademiya Nauk, Kazakh SSR, Alma Ata, Kazakh SSR,

34 Ways to Make One-Dish Shrimp Meals, 11 pp., printed, Continental Sea Foods, Inc., 501 W. 16th St., New York, N. Y. 10011. Contains recipes for preparing frozen ready-to-cook small shrimp in a variety of dishes in 30 minutes. Tips are given for adding shrimp to avocado, spaghetti sauce, chow mein, soup, and salad. Included are recipes for shrimp in tomato, baked shrimp Florentine, shrimp stuffed tomatoes, shrimp sole casserole, curried shrimp with rice, baked shrimp in shells, shrimp Cantonese, broiled shrimp sandwich, shrimp Alfredo, and shrimp scramble.

SOMALI REPUBLIC:

Basic Data on the Economy of the Somali Republic, by Joseph Eblan, OBR 65-8, 16 pp., illus., printed, Feb. 1965, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Somali Republic prepared a Five Year Plan in 1963 which outlines improvement aims in every economic and social sector. The report presents details on geography and climate, form of government, and population; structure of the economy; agriculture; mineral resources; industry and power. Also includes information on transportation, communications, finance, foreign trade, a program for economic development, and marketing. A short section on fishing discusses Somalia's abundant fishery resources and the tuna canning and exporting industry.

SOUTH AFRICA REPUBLIC:

Industrial Censuses, 1950-51 to 1960-61. 1.--Preparation and Preserving of Meat; Sausage Casings, Tallow, Dripping and Lard; 2--Crayfish; Fish Preserving and Other Fish Products, Report No. I. C. 1, 48 pp., processed in Afrikaans and English, Nov. 1964. Bureau of Statistics, Republic of South Africa, Pretoria, Republic of South Africa. This is the first of a series of reports showing the final results of the annual industrial census according to kinds of manufacturing industry. Detailed statistics are shown for each of the eleven census years from 1950-51 to 1960-61. It also contains provisional summary figures for the year 1961-62. Part 2, on spiny lobster processing, fish preserving and other fish products, presents data on ownership by private limited liability companies, number of establishments by employee size group, net output per employee and employment per establishment by employee size group, employment of working proprietors, employment by paid employees, and total salaries and wages for financial year. Also includes statistical tables on employment--production, maintenance, and related workers; employment--administrative, clerical, and sales personnel; payments in kind for financial year; cost of South African and imported materials for processing and packing; closing stocks; physical assets, depreciation, and rent paid; number of establishments and gross output, South Africa and provinces; number of establishments by industrial areas and certain economic regions.

SPAIN:

The following articles are from Boletin de Informacion, nos. 74-75, Nov. -Dec. 1964, printed in Spanish. Sindicato Nacional de la Pesca, 18-20 Paseo del Prado, Madrid, Spain.:

"Actividades de la Direccion General de Pesca Maritima. I--Presencia Española en los organismos internacionales relacionados con la pesca maritima; II--Concesiones y aprovechamientos; III--Expansion de la flota pesquera; IV--Aprovisionamientos a la flota pesquera; V--La ciencia y la pesca" (Activities of the Department of Marine Fisheries. I--Spanish membership in the international organizations related to marine fisheries; II--Concessions and developments; III--Expansion of the fishing fleet; IV--Outfitting of the fishing fleet; V--Science and the fisheries; pp. 5-15, illus.

"La evolucion pesquera en cifras" (Fishery development in figures), pp. 22-24.

SPORT FISHING:

"The economic aspects of sport fishing," article, Trade News, vol. 17, no. 6-7, Dec. 1964-Jan. 1965, pp. 6-13, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

SQUID:

"Squid as seafood," article, Fisheries Newsletter, vol. 23, Aug. 1964, p. 23, printed. Fisheries Branch, Department of Primary Industry, Canberra, Australia.

STANDARDS:

The following Amendments to the Federal Food, Drug, and Cosmetic Act are available from the Food and Drug Administration, U. S. Department of Health, Education, and Welfare, Washington, D. C. 20201.:

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Fish Definitions and Standards, Part 37, Title 21, Code of Federal Regulations, 8 pp., printed. (Reprinted from the Federal Register: April 16, 1964; 29 F. R. 5225.)

Shellfish Definitions and Standards, Part 36, Code of Federal Regulations, 7 pp., printed. (Reprinted from the Federal Register: May 7, 1963; 28 F. R. 4556.)

STORAGE LIFE:

"Time-temperature tolerance of frozen seafoods. I--Review of some of the recent literature on the storage life of frozen fishery products," by J. Perry Lane, article, Food Technology, vol. 18, no. 7, July 1964, pp. 156-162, printed, single copy \$1.50. Food Technology, 510 N. Hickory St., Champaign, Ill. 61823.

STURGEON:

"Comparative evaluation of the costs of young of sturgeons under various methods of commercial breeding," by Yu. I. Zaidiner, I. Ya. Gol'dman, and F. V. Averkiev, article, Trudy AzNIIRKh, vol. 6, 1963, pp. 241-251, printed in Russian. Azovskii Nauchno-Issledovatel'skii Institut Rybnogo Khoz-yaistva, Moscow, U.S.S.R.

TAGGING:

The following reprints are from Journal of the Fisheries Research Board of Canada, vol. 20, no. 6, 1963. Queen's Printer and Controller of Stationery, Ottawa, Canada.

Spring Stainless Steel Anchor Tag, by G. H. Lawler, illus., p. 1553.

Use of Coloured Tags in Fish Population Estimates, by G. H. Lawler and G. F. M. Smith, pp. 1431-1434.

TRADE LISTS:

The U. S. Department of Commerce has published the following mimeographed trade lists: Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of International Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Japan, 24 pp., January 1965. Lists the names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm. Also contains trade and industry data (including fishery products) on production, exports, imports, and export control of canned, bottled, and frozen foods.

Oils (Animal, Fish and Vegetable)--Importers, Dealers, Producers, Refiners and Exporters--Norway, 12 pp., Jan. 1965. Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish, seal, and whale oils. Also contains trade and industry data (including fish and whale oils).

Oil (Animal, Fish and Vegetable)--Importers, Dealers, Producers, Refiners and Exporters--Peru, 12

pp., Jan. 1965. Lists the names and addresses, size of firms, and types of products handled by each firm. Includes firms dealing in fish oil, fish meal, and canned fish. Also contains trade and industry data (including fish oil).

TRAWLERS:

Medium Trawler, by Shinji Endo, No. 3, 56 pp., illus., printed in Japanese. Japan Fisheries Resource Conservation Association, Shiba Nishikubo Sakuragawa-cho, 24, Minato-ku, Tokyo, Japan.

TRAWLING:

"Influence of trawling speed on the parameters and the strain of the trawl net," by A. N. Samaryanov, article, Trudy Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoz-yaistva i Okeanografii, vol. 21, 1961, pp. 3-15, printed in Russian. Azovo-Chernomorskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoz-yaistva i Okeanografii, Moscow, U.S.S.R.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 13, no. 1, Jan. 1965, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Contains, among others, these articles: "Black caviar production and its problems in Turkey. Part II," by Cevdet Aygun; "Technological developments in the field of fish flour. Part II," by Hikmet Akgunes; and "The role of fish in animal feeding and nutritional contributions of fish products. Part I," by Macide Akgunes.

U.S.S.R.:

Kholodil'naiia Tekhnika, no. 6, 1964, 80 pp., illus., printed in Russian with English table of contents. Four Continent Book Corp., 822 Broadway, New York, N. Y. 10003. Includes, among others, articles on: "Leningrad Fish Storage Warehouse No. 4," by M. S. Ginburg, L. F. Rumyantsev, and S. V. Vinogradova; and "Investigation of time of freezing fish in blocks," by G. S. Konokotin.

VESSELS:

"Kongres panstw Socjalistycznych w sprawach floty rybackiej" (Congress of socialist countries on fishing fleet operations), by Andrzej Ropelewski, article, Gospodarka Rybna, vol. 17, no. 2 (164), 1965, pp. 3-5, printed in Polish. Gospodarka Rybna, Aleje Jerozolimskie 28, Warsaw, Poland.

WHALES:

"Blood types of some species of Antarctic whales," by K. Fujino, article, American Naturalist, vol. 46, no. 889, 1962, pp. 205-210, printed. The Science Press, Lancaster, Pa.

WHALING:

A Caccia de Balene (Whale Hunting), by Piero Pieroni, 150 pp., illus., printed in Italian, March 1964, L. 3,800 (about US\$6.10). Officine Grafiche Vallecchi Editore, Florence, Italy. A beautifully-illustrated book, using both full-color and black-and-white photos and drawings, giving the history of whaling and describing both modern and older whaling operations.

"Crisis in the whaling industry," by John Hillsby, article, New Scientist, vol. 23, Aug. 13, 1964, pp. 368-

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370, printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

YUGOSLAVIA:

Market Factors in Yugoslavia, by Arthur J. Laemmerzahl, OBR 64-140, 8 pp., printed, Dec. 1964, 15 cents. Bureau of International Commerce, U. S. De-

partment of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) In addition to market outlook in Yugoslavia, the report discusses the scope and nature of the market, commercial competition, market analysis for selected commodities, and a market profile for the country.



MIAMI SCIENTISTS DISCOVER NEW FAMILY OF FISH

A new family of extraordinary ocean fish has been discovered by biologists at the Institute of Marine Science, University of Miami. The discovery was announced April 1, 1965, in the Institute's scientific publication Bulletin of Marine Science.

The first representative of the new group to be seen by scientists was caught in a plankton net on August 7, 1964, in the western Atlantic, 150 miles due east of Cape Kennedy. The specimen was taken near midnight at a depth of about 60 feet and, remarkably, came aboard the ship alive and in excellent condition. Upon being placed in a laboratory aquarium aboard the research vessel John Elliott Pillsbury, the strange fish swam about vigorously while motion pictures and other photographs were made of its swimming behavior.

Solid black and about an inch long, the fish had a broad, flat head and enormous eyes. Attached to its underside was a long filament equipped with many leafy appendages. Each appendage displayed an oval luminescent spot. As the fish swam jerkily about the aquarium, the appendages streamed out behind. In the darkness only the orange spots on the appendages were visible, resembling a cluster of jellyfish-like animals known as siphonophores. Scientists suggest that the remarkable appendages may be used as a form of camouflage. Possibly the fish lives among groups of jellyfish or siphonophores (hundreds of jellyfish were caught in the same plankton tow with the strange fish) and is protected from predators by its mimicry of the stinging animals. Because of the form and structure of the fish's dangling appendages, the new fish has been given the common name of siphonophore fish, and the scientific name of Kasidoron edom. The family has been named Kasidoroidae. The fish is believed to inhabit regions from about 450 to 1500 feet deep during the day and to come near the surface at night.

Two other specimens of the family, both smaller than the one captured alive, were taken the same night in the same area. They were brought aboard dead, as is usually the case with midwater fish caught in nets. On examination of previous plankton catches made on the cruise, Institute scientists learned that a tiny specimen of the same group (an immature fish less than one-third of an inch long) had been netted four days earlier while the vessel towed plankton nets near a seamount 15 miles northeast of Bermuda.

"Finding a new family of fishes in this day and age is an extraordinary achievement," stated the Director of Miami's Institute of Marine Science. "It is particularly remarkable to find an entirely new group of fish in surface layers of water in the western Atlantic, where a great deal of scientific studies have been made"

THIRD "TRAILERSHIP" ENTERS ALASKA SERVICE

In early April 1965, the 523-foot "trailership," S. S. Summit, entered service between Seattle, Wash., and Alaska ports, supplementing the service established in May 1964 by the trailerships Seattle and Anchorage. The Summit is a modified T-2 tanker which has been adapted to carry 196 35-foot truck trailers, including 60 refrigerated reefers. The Summit can carry more trailers than the other trailerships, but it lacks their break-bulk cargo capacity.



The S.S. Summit loaded with a cargo of truck trailers.

The trailerships are providing weekly service between Seattle and Alaska. Their reduced loading time allows delivery in Anchorage, Alaska, 4 days after loading in Seattle.

Note: See pp. 40-41 of this issue for details on the trailerships Seattle and Anchorage and also for a description of the vanships Nadina and Tonsina.



TUNA BECOMES MORE IMPORTANT ON ATLANTIC COAST

Commercial tuna fishing came of age in New England waters in 1962 when purse seiners caught over 7 million pounds. Then landings on the Atlantic coast in 1963 nearly doubled those of 1962, and accounted for 4 percent of the total United States tuna catch.

HONG KONG PRAWNS

會長樂美部建

CRAB FOO YUNG

- 1 pound crab meat, fresh or frozen or
- 3 cans (6 1/2 ounces) crab meat
- 6 eggs, beaten
- 1 can (1 pound) bean sprouts, drained

Thaw frozen crab meat or drain canned crab meat. Remove any remaining shell or cartilage from crab meat. Combine all ingredients except sauce and sesame seeds. Pour 1/2 cup crab mixture onto a hot greased griddle or frying pan. Fry about 2 minutes or until browned on the underside. Turn and fry about 2 minutes more or until bottom is browned. Drain on absorbent paper. Keep warm. Pour Foo Yung Sauce over patties and sprinkle with sesame seeds. Serves 6.

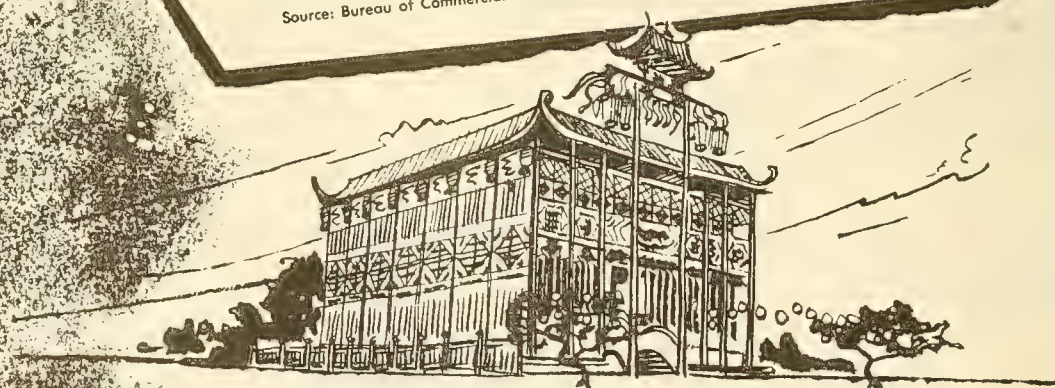
- 1/2 cup finely chopped green onions
- Dash pepper
- Foo Yung Sauce
- 1 tablespoon toasted sesame seeds

FOO YUNG SAUCE

- 2 chicken bouillon cubes
- 1/2 teaspoon sugar
- 2 cups boiling water
- 2 tablespoons cornstarch
- 2 tablespoons soy sauce

Dissolve bouillon cubes and sugar in boiling water. Dissolve cornstarch in soy sauce. Add to bouillon mixture and cook until thick and clear, stirring constantly.

Source: Bureau of Commercial Fisheries, U. S. Department of the Interior



Hong Kong Pavilion at New York's World's Fair.

--"World's Fair Seafood Fare," Special Fisheries Marketing Bulletin, issued by the U. S. Bureau of Commercial Fisheries as a part of its continuing consumer education program in cooperation with the commercial fishing industry.



HIGHLIGHTS IN THIS ISSUE (MAY 1965)



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Skipjack tuna fishing on a Hawaiian sampan.

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Fishes

COMMERCIAL FISHERIES REVIEW



VOL. 27, NO. 6

JUNE 1965

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
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COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
G. A. Albano and H. Beasley, Assistant Editors

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AN EXPERIMENT IN ELECTRICAL FISHING WITH AN ELECTRIC FIELD USED AS AN ADJUNCT TO AN OTTER-TRAWL NET

By Ernest D. McRae, Jr.* and Leon E. French, Jr.**

SUMMARY

Electrical fishing is not a new fishing method; however, problems with application in a marine environment have limited its successful use to date. As part of cooperative research with the Smith Research and Development Company (SRD), the U. S. Bureau of Commercial Fisheries test-fished electrical fishing equipment (developed by SRD) which was designed to overcome these problems.

The tests were conducted on New England commercial fishing grounds and used an electric field as an adjunct to an otter trawl (net) of commercial design. To determine the fishing effectiveness of the electric field, a comparative method of towing was employed. This consisted of a series of as nearly identical tows as possible with the electric field used on alternate tows.

The test results indicate that for over-all fishing, the net with the electric field fished over 2.3 times as effective as the net alone. The fishing effectiveness of the net with the electric field was 1.5 times that of the net alone for taking cod and haddock. For flatfish, the net with the electric field was twice as effective as the net without the field. The catch rate for taking whiting with use of the electric field was 4.4 times the catch rate of the net alone.

Plans for future work include specific testing to determine the answers to some of the questions unresolved by these tests.

INTRODUCTION

Efforts to catch fish by means of an electric current, used independently or combined with accessory gear, have been fairly common since the 1930's. Such efforts and the hopes of the various investigators of electrofishing methods have been based upon two types of reaction of fish to d.c. electric currents. These reactions have been termed *electrotaxis*: the guiding and stimulation of swimming activity by means of electricity, and *electronarcosis*: the stunning of the fish for electrical shock.

* Supervisory Fishery Biologist (General)

** Electronics Development Technician



Fig. 1 - The Bureau of Commercial Fisheries' vessel Delaware operated by the Exploratory Fishing and Gear Research Base, Gloucester, Mass.

Exploratory Fishing and Gear Research Base, U. S. Bureau of Commercial Fisheries, Gloucester, Mass.

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If the proper form of electrical current is passed through a body of water containing fish, a remarkable change in the normal behavior pattern can be observed: the fish turn in the direction of the positive electrode (the anode) and swim toward it. They will continue in this manner until they arrive within a certain proximity of the anode where, dependent upon the species of fish, the size of the individual, and the intensity of the electrical current, they become immobilized, turn on their backs or sides, and remain in this stunned state until the electric power is turned off. After a recovery period, the fish can be induced to reverse their direction and swim to the opposite electrode by changing the polarity of the electrodes.

Upon observing this reaction, one is inclined to visualize an installation of generators or batteries with wires and electrodes placed in appropriate bodies of water, continuously gathering in quantities of fish which can be removed by a simple mechanical means such as a dip net, seine, conveyor, or other device.

This has, indeed, been demonstrated to be an effective means of catching fish in fresh water. Many state conservation agencies collect game fish species for biological studies using simple battery-powered back-pack shockers or portable generators. (Use by private citizens for collection of fresh-water species is generally prohibited by law.) Successful application in fresh water, however, has not been easily duplicated in sea water. Perhaps the most important factor which has limited the successful use of an electric field in marine waters is the electrical conductivity of the sea water; as the salinity increases, so does the ionic concentration and the resulting electrical conductivity of the water.

Earlier investigators of marine electrical fishing have determined that the conductivity of sea water is approximately 500 times greater than the average body of fresh water (Meyer-Warden 1957). Because of this, the use of simple a.c. or continuous d.c. electric power is impractical for marine electrofishing. According to such investigations, it would be necessary to produce up to approximately 10,000 kilowatts (10 million watts) of electric power to attain an electrical fishing range (spherical radius from an electrode) of 10 meters (32.8 feet).

The search for a solution to astronomical power requirements has led, through extensive research by physicists, biologists, and engineers in various countries over the past 20 years, to the general use of one or another form of condenser discharge pulses, or bursts of electrical power applied at intervals. A major advantage of this type of discharge is that a bank of condensers can be charged over a relatively long period of time, for example, 20 milliseconds, and discharged in a short period, one millisecond or less. Such an arrangement effects a great conservation of electrical power (Kreutzer 1963) and, to the encouragement of research efforts, has been determined to be extremely effective in guiding and stunning most species of fresh- and salt-water fish. The experiment reported here was conducted with a particularly effective modification of such high-power condenser-discharge pulses.

The major problems in the marine application of an electric field to groundfish fishing are (1) to supply the electric current required to produce the desired effect upon the fish, (2) to transform the current into the most efficient and effective form and type to catch fish, (3) to transport this current from the ship to the net (where it will be used) without exorbitant loss, (4) to overcome or eliminate the effect of electrolysis upon the electrodes, and (5) to provide rugged and practical equipment components necessary to withstand use aboard ship and severe treatment during fishing operations.

With the exception of item (1) above, the solution to each major problem depends upon the successful resolution of a number of other directly or collaterally associated problems. Many of these are highly technical in nature and require specialized knowledge and training in fields which are frequently distinct and dissociated. Mainly for this reason, progress to date has been limited. However, successful electric harpoons and hooks, which shock large fish or mammals into submission, have been developed and used (Houston 1949) and, in the menhaden fishery, the "attracting effect" (electrotaxis) of an electric field is currently being used in conjunction with pumps as a means for transferring net-caught fish from the sea to ships' holds. Also, electrical currents have recently been successfully tested and experimentally

used in fishing for shrimp in the Gulf of Mexico (Wathne 1963); plans for commercial application are now being expedited. These, and perhaps other illustrations, can be cited as examples of present use of this fishing method in the sea; but extended work is still required before commercial-scale employment of the electrical fishing method in the groundfish fishery can be achieved.

The purpose of this paper is to report on one segment of continuing research which has had successful results. Efforts were made to guide bottom-dwelling fish toward the opening of an otter-trawl being towed across the sea bottom in the usual manner and to shock them sufficiently upon their arrival at the net so that they would be immobilized and swept easily into the body of the trawl. The equipment was thus designed to prevent escapement of the fish within the path of the trawl and to eliminate the possibility of any of the fish swimming back out of the mouth of the net once they had been engulfed by it. The electrical equipment^{1/} used was developed by the Smith Research and Development Company of Lewes, Del.

EXPERIMENT

Fishing trials were conducted over portions of commercial fishing banks which are fished seasonally by New England trawlers for groundfish. The depths fished ranged from 47 to 58 fathoms, most of the tows being made in depths between 50 and 56 fathoms. The transport of current was over a 300-fathom length of conductor-towing warp which was payed out as needed from a trawl winch. (The entire 300 fathoms remained in the electrical circuit at all times regardless of what portion of the warp was run off the winch into the water).

The tests were conducted from July 11 to August 24, 1962, by staff members of the Bureau's Exploratory Fishing and Gear Research Base, Gloucester, Mass., using the exploratory fishing vessel *Delaware* (fig. 1). Representatives of the Smith Research and Development Company installed their equipment and operated it during most of the cruise.

FISHING AREAS: The areas in which the tests were conducted (fig. 2) were chosen because of (1) their good trawlable bottom (a necessity for avoiding possible damage to, or loss of, the electrical components on the net), and (2) their close proximity to each other (in the event it became necessary, in order to maintain suitable catches of fish, to shift fishing areas during the tests). The primary fishing area chosen lies offshore from Cape Cod in the general area between Nauset Harbor and Chatham, Mass., in approximately 49 to 58 fathoms of water (long. $69^{\circ}42.5'$ W., lat. $41^{\circ}43.5'$ N.; to long. $69^{\circ}48.5'$ W., lat. $41^{\circ}47.7'$ N.). The secondary fishing area chosen lies on the western side of Georges Bank in a region known as the "Bight of Clarks" (long. $68^{\circ}33.2'$ W., lat. $41^{\circ}27.5'$ N.; to long. $68^{\circ}30'$ W., lat. $41^{\circ}32.5'$ N.). The fishing tests were made in two parts: during the first part, all fishing was in the Cape Cod area; during the second part, fishing was conducted in both the Cape Cod and Bight of Clarks areas.

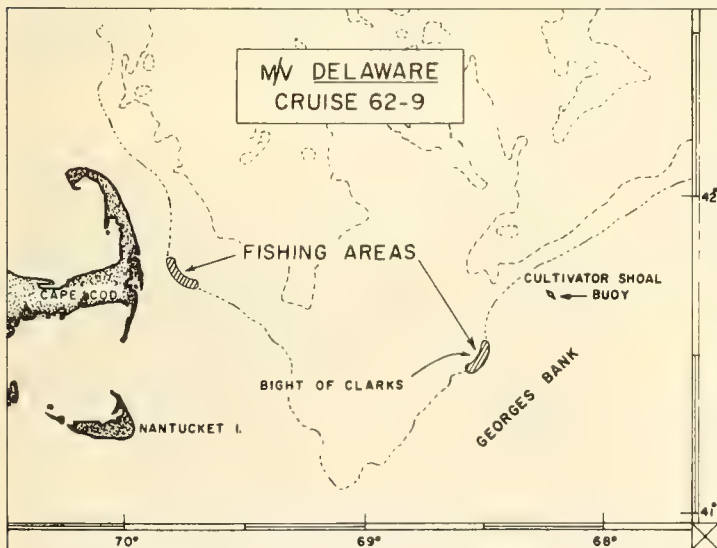


Fig. 2 - Areas fished during electrical-fishing experiments.

FISHING GEAR: A No. 41 large-mesh otter trawl was used during the experiments. This net had a 79-foot headrope and a 100-foot footrope. It was rigged with three 15-foot sections of 16-inch diameter wooden rollers on the footrope, 5-fathom wire legs, and 30 floats on the headrope; the floats were cast aluminum

^{1/}Details of the electrical equipment are included in a separate appendix attached to the reprint of this article.

with 7.5 pounds of static lift for each. The internal stretched mesh size of the netting measured 4.5 inches. The net was constructed of multifilament polypropylene twine. Accessory ropes were either polypropylene or nylon. Trawl warps were $1\frac{1}{16}$ -inch diameter conductor-cable (fig. 3).

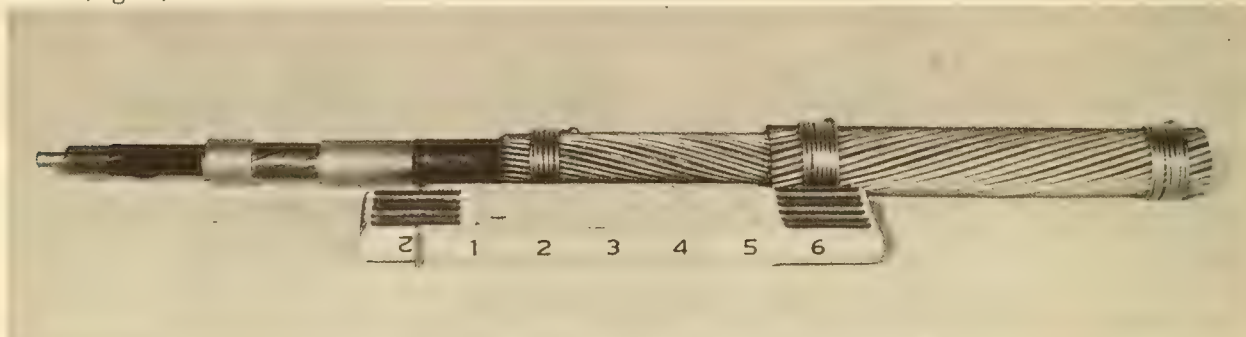


Fig. 3 - Construction details of special electrical-conductor trawl cable.

The conductor cable is made of two distinct parts: (a) strength members, and (b) electrical conductors. Two outer layers of single-strand steel wires provide tensile strength in this cable; to reduce kinking, one layer is left-lay while the other is right-lay. Two No. 4 (American Wire Gage) unplated copper conductors were arranged coaxially and, with their insulating material, formed the core of the cable. Disconnect plugs made the electrical connections at the winch drums; conduit-housed wires conducted the current from its source to these plugs.

Special accessory gear were (1) patented cable grips to attach the linkage for the trawldoor hook-up towing chain to the towing warp without making a break in the electrical conductors, and (2) sheaves of especially large diameter required by the large size electrical conductor trawl warp. The cable grips were the type that wrap around the cable upon which they are mounted (the towing warp) and contract when pulled upon to increase their grip as the tension is increased. The normal 16-inch sheaves aboard the Delaware were replaced with sheaves of 25-inch outside diameter and $20\frac{1}{2}$ -inch groove diameter; these were the largest size that could be accommodated by the gallows frames and were considered to be about the smallest practical diameter for the size of coaxial cable used.

PROCEDURE

The fishing tests were conducted in two parts; during both parts the net transformers or cable-output transformers (fig. 4) were shackled to the footrope of the net and the cathodes were laced to the netting in the after part of the bottom belly.

The first part of the fishing tests were made with the anodes laced to the netting just behind the footrope and positioned around the transformers (fig. 5).

The second part of the tests was made with the anodes positioned just behind the headrope of the net. While the anodes were positioned at the headrope, that portion of the electrical field which is formed about the anodes was spread between the electrodes at the headrope and the transform-



Fig. 4 - Unattached net transformer (cable-output transformer).

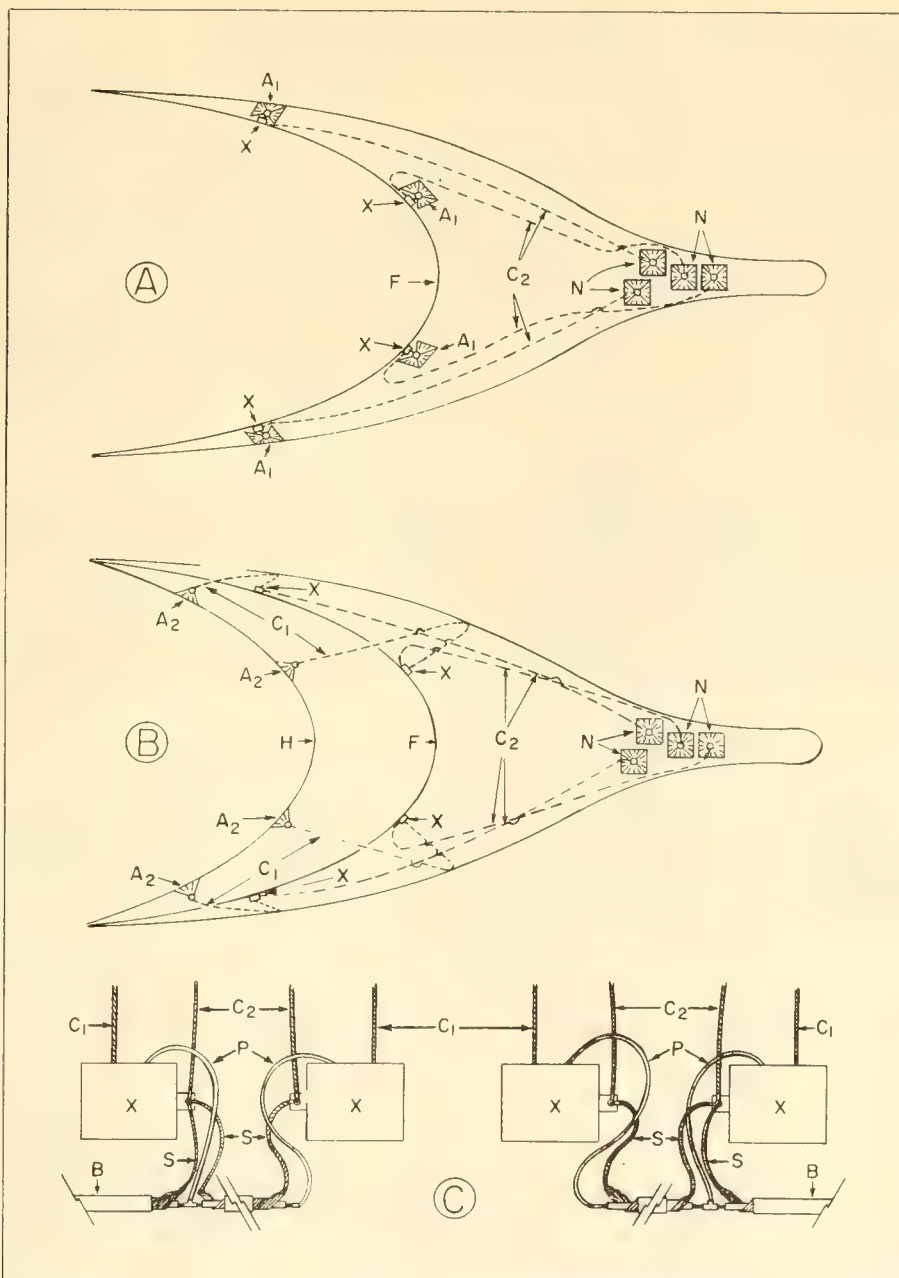


Fig. 5 - Electrical arrangement on net. (A) Transformers and anodes at net footrope. (B) Anodes at net headrope, transformers at footrope. (C) Hook-up arrangement of net transformers. Key: F=footrope; H=headrope; X=transformers; A₁=anode positioned near footrope; A₂=anode positioned near headrope; N=cathode; P=high-voltage conductor to transformer primary; S=shield (common return from transformer primary and secondary); C₁=conductor from transformer secondary to anode; C₂=conductor from transformer secondary to cathode; B=conductor for high-voltage current from shipboard power source.

ers at the footrope, the aluminum housings of which also acted as anodes. Whatever the effect anode separation may have had upon the shape of the electric field, the undetermined effect of this modification should not be overlooked when examining the catch results for the influence of anode position upon the catch.

Comparative towing was conducted in the following manner:

1. Starting with the first tow each morning, the electric field was used during alternate tows.
2. Two consecutive tows were made in the same direction before reversal of tow direction.
3. The second two tows (following the change in tow direction after the first two tows were completed) returned to the original starting position.
4. After the fourth tow, the direction of towing was again reversed to repeat (2) and (3) above.
5. Towing followed a depth contour between loran bearings so that the tows were very nearly equal in length without influence by wind or tide; each tow was approximately $2\frac{3}{4}$ miles long.
6. From time-to-time, minor changes were made in the towing depth in order to avoid "fishing out" the work area.
7. In order to minimize the effect of daylight or early morning hours upon the total catch, the first tow each morning alternated in use of the electric field with the first tow of the previous morning.
8. At the beginning and the end of every tow, a check was made to determine (through measuring the "spread resistance" of the electrodes) whether or not the submerged portion of the electrical system was properly functional; repairs were made, as the need was indicated, before continued use.

FISHING RESULTS

During the cruise, a total of 82 tows were made; table 1 gives a breakdown of the catch by species for successful tows with and without the electrical field when the anodes were on the footrope and when they were on the headrope.

Table 1 - Catch During Delaware Cruise 62-9

Species	With Anodes on Footrope (45 Tows)		With Anodes on Headrope (36 Tows)	
	With Elect. Field (22 Tows)	Without Elect. Field (23 Tows)	With Elect. Field (17 Tows)	Without Elect. Field (19 Tows)
	(Number of Individual Fish)			
Butterfish	0	0	127	86
Cod	116	108	33	28
Haddock	1,127	874	476	244
Red hake	1,063	137	235	54
White hake	4	7	4	2
Herring	180	6	80	14
Ocean perch	2	0	0	3
Pollock	9	12	3	1
Whiting	394	52	456	148
Wolfish	1	5	0	1
Blackback or lemon sole . .	3	2	13	7
Dab	918	515	453	410
Four-spot	0	0	0	1
Grey sole	565	208	408	86
Yellowtail	17	5	9	12
Lumpfish	0	0	1	1
Monkfish	119	32	117	52
Ocean pout	67	27	7	2
Sea Raven	44	69	38	42
Rockling, four-bearded . . .	0	0	1	0
Sculpin	23	13	36	11
Shad	6	2	1	1
Dogfish	190	195	9	18
Skate	55	65	195	110
Crab	0	0	1	1
Lobster	3	0	1	0
Scallop	0	0	88	55
Shrimp	0	0	0	6
Squid	747	360	540	678

A visual comparison between the catches made with and without the electric field, as well as possible changes in the catch with change of anode position and the effect of fishing areas upon the catch is facilitated by the graphic representation of the catches of individual species of fish made during each tow. A separate illustration is required for each species. Block diagrams of the catches of three species of commercial importance, specifically haddock (*Melanogrammus aeglefinus*), gray sole (*Glyptocephalus cynoglossus*), and whiting (*Merluccius bilinearis*), appear in figure 6.

Tows numbered 1 to 45 were made with the anodes at the footrope; the remaining tows (46 to 82) were all made with the anodes at the headrope. All tows, except numbers 69 to 77 inclusive, were made in the primary fishing area off of Cape Cod; the excepted tows were made at the Bight of Clarks in the secondary fishing area.

Whiting are normally fished with smaller mesh nets than the one used during the experiment. The increased number of whiting taken with the electric field (fig. 6) may have, in part, reflected escapement through the large mesh when the electric field was not in use. Additional comparative tests on this species (using a whiting net with and without the electric field) will be necessary before further conclusions can be drawn.

Due to the uneven number of comparative tows, a visual comparison of catch results is difficult. To facilitate a direct comparison, adjustments to the data can be made so that (1) the number of comparative tows (with and without the electric field) is equal, and (2) the catches resulting from the deleted tows are also subtracted from the total catch. Three tows are suitable for this adjustment: tow number 45 was the last tow completed on a day during which an odd number of tows was made; towing was begun and ended this day with non-electric tows. By deleting the last tow, the numbers of electrical and non-electrical tows is evened. Tow number 49 was an electrical tow which was not completed due to electrical difficulties. The

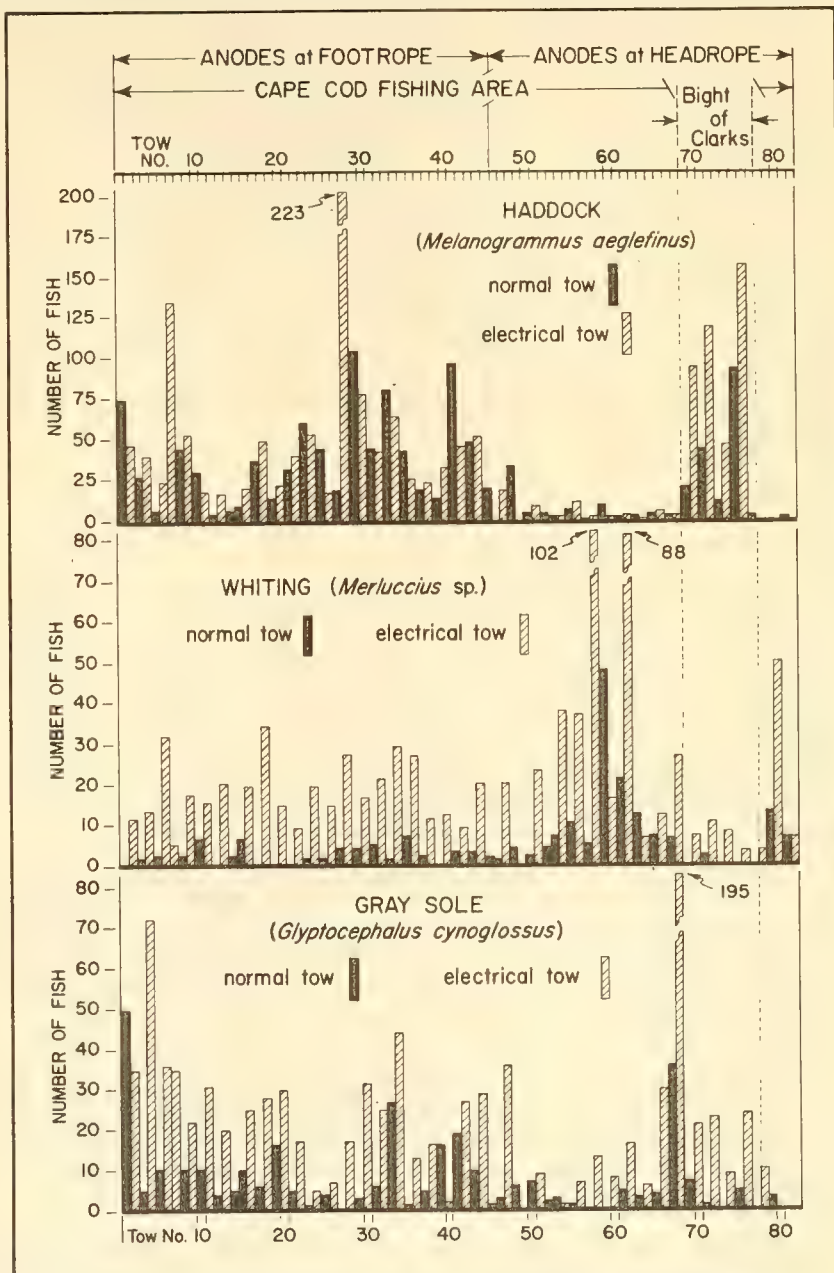


Fig. 6 - Catches of haddock, whiting, and gray sole for each tow during Delaware Cruise 62-9.

By deleting the last tow, the numbers of electrical and non-electrical tows is evened. Tow number 49 was an electrical tow which was not completed due to electrical difficulties. The

comparative non-electrical tow (No. 48) is correspondingly deleted. Tow number 52 (like tow number 45) was an extra non-electrical tow completed at the end of a day which had begun with a non-electrical tow. By deleting tow 52, the numbers of comparative tows is again evened. The adjusted catch is shown in table 2.

Table 2 - Adjusted Catch of Delaware Cruise 62-9

Species	With Anodes on Footrope (Adjusted to 44 Tows)		With Anodes on Headrope (Adjusted to 34 Tows)	
	With Elect. Field (22 Tows)	Without Elect. Field (Adj. to 22)	With Elect. Field (17 Tows)	Without Elect. Field (Adj. to 17)
	(Number of Individual Fish)			
Butterfish	0	0	127	86
Cod	116	105	33	23
Haddock	1, 127	854	476	206
Red hake	1,063	132	235	49
White hake	4	7	4	2
Herring	180	6	80	14
Ocean perch	2	0	0	2
Pollock	9	12	3	1
Whiting	394	50	456	140
Wolfish	1	4	0	1
Blackback or lemon sole	3	2	13	7
Dab	918	500	453	361
Four-spot	0	0	0	1
Gray sole	565	207	408	78
Yellowtail	17	5	9	10
Lumpfish	0	0	1	1
Monkfish	119	32	117	49
Ocean pout	67	27	7	2
Sea raven	44	60	38	35
Rockling, four-bearded	0	0	1	0
Sculpin	23	13	36	10
Shad	6	2	1	1
Dogfish	190	189	9	18
Skate	55	52	195	108
Crab	0	0	1	1
Lobster	3	0	1	0
Scallop	0	0	88	55
Shrimp	0	0	0	6
Squid	747	360	540	450

It should be noted that butterfish, four-spot, lumpfish, crab, shrimp, and scallop were taken only during the second part of the experiment while fishing at the Bight of Clarks. Failure of those species to appear in the catches taken during the first part, when the anodes were on the footrope of the net, is not assumed to be correlated with the electrode position; fishing during the first phase of the tests was conducted entirely in the Cape Cod area where those species, apparently, did not occur at that time.

The catch of some of the species shown on tables 1 and 2 (notably white hake, ocean perch, and pollock) indicate an apparent reversal in numbers taken with the change of anode position. This may or may not be true--the numbers of those species were small and sampling variation, with fluctuation in availability, could effectively obscure the expression of a valid trend. Additional data is required to clarify any effect of the changed anode position upon the catch of these species of fish.

A better way of handling the results is to use all of the catch data and to determine the average (mean) number of each species of fish taken per tow by each method. By separating the catches made while the anodes were in different positions, it is possible to discern the effect, if any, of anode position upon the catch. Table 3 shows the mean number of fish taken per tow during the comparison tows; the two positions of the anodes and the resulting catch rates are also indicated.

To evaluate the fishing effectiveness of the electric field, as compared to the net without the field, a comparison is made between the catches which were taken by each method. From the data given in table 3, a weighted averaged of 4.80 fish (for each of the 15 commercial species listed) was taken per tow without using the electric field. The comparable average for

Table 3 - Mean Number of Individual Fish of Each Species Taken Per Tow During Electrical and Nonelectrical Comparative Fishing				
Species	Anodes on Footrope		Anodes on Headrope	
	With Elect. Field (22 Tows)	Without Elect. Field (23 Tows)	With Elect. Field (17 Tows)	Without Elect. Field (19 Tows)
	..... (Number of Individual Fish)			
Butterfish	0	0	7.5	4.5
Cod	5.3	4.7	1.9	1.5
Haddock	51.2	38.0	28.0	12.8
Red hake	48.3	6.0	13.8	2.8
White hake . . . . .	.2	.3	.2	.1
Herring	8.2	.3	4.7	.7
Ocean perch . . . . .	.1	0	0	.2
Pollock . . . . .	.4	.5	.2	.1
Whiting	17.9	2.3	26.8	7.8
Wolfish . . . . .	.1	.2	0	.1
Blackback or lemon sole . .	.1	.1	.8	.4
Dab	41.7	22.4	26.6	21.6
Four-spot	0	0	0	.1
Gray sole	25.7	9.0	24.0	4.5
Yellowtail . . . . .	.8	.2	.5	.6
Mean (of the means) for commercial species above	(200/15) 13.33	(83.8/15) 5.59	(135/15) 9.00	(57.8/15) 3.85
Lumpfish	0	0	.1	.1
Monkfish	5.4	1.4	6.9	2.7
Ocean pout	3.0	1.2	.4	.1
Sea raven	2.0	3.0	2.2	2.2
Rockling, four-bearded . .	0	0	.1	0
Sculpin	1.0	.6	2.1	.6
Shad . . . . .	.3	.1	.1	.1
Dogfish	8.6	8.5	.5	.9
Skate	2.5	2.8	11.5	5.8
Crab	0	0	.1	.1
Lobster . . . . .	.1	0	.1	0
Scallop	0	0	5.2	2.9
Shrimp	0	0	0	.3
Squid	34.0	15.7	31.8	35.7

fish taken with the electric field was 11.44. This indicated that the net with the electric field fished 2.38 times as effectively as the net alone. Calculations for the values shown were:

- a. $(5.59 \times 23) + (3.85 \times 19) / 23 + 19 = 4.80$;
- b. $(13.33 \times 22) + (9.00 \times 17) / 22 + 17 = 11.44$;
- c. $11.44 / 4.80 = 2.38$.

To determine the effect which the anode position may have had upon the catches, a comparison is made between the fishing effectiveness of the net with the electric field while the anodes were at the different positions. With the anodes at the footrope, the catches were 2.39 times the nonelectric catches. With the anodes at the headrope, the catches were 2.34 times the nonelectric catches. The difference between those two values is 0.05 or less than 2 percent of either value. This small difference is not considered to be significant as other variables could have introduced larger differences.

Based upon the above, conclusions might be drawn that, for overall catches of fish, no significant differences resulted from different positions of the anodes. While this may be true for overall catches, conclusions should not be drawn concerning the effect of anode position upon the catch of individual species of fish where species behavior and level of susceptibility to pulse frequency, pulse shape, or to the strength of the field may determine a real difference in catch levels with the change of anode position. Adequately programmed research in the future would include (1) experimentation with electrode position for a determination of optimum position for species effect, (2) levels of species susceptibility, and (3) optimum pulse shape and frequency for influencing commercially desirable size fish.

Otter-trawling is the fishing method most used in New England waters for taking ground-fish. For this reason, the data on cod (*Gadus callarias*) and haddock (*Melanogrammus aeglefinus*) are considered separately. When the data for those two species are grouped, about 1.5

times as many fish of those species were taken when the electric field was in use as were caught by the net without the field.

However, this method of consolidating the data tends to obscure a difference between catches made with the anodes in different positions. While the anodes were at the footrope, the mean electric catch rate was about $1\frac{1}{2}$ times (1.32) the nonelectric catch rate; but when the anodes were at the headrope, the electric catch rate was slightly more than double (2.09) the nonelectric catch rate. The difference between 2.09 and 1.32 is 0.77; this is 36.8 percent of the former and 58.3 percent of the latter value. There is a significant difference here which will be considered during future work.

For analysis of the effect that might be expected in the flatfish fishery, the data for lemon sole and blackback (Pseudopleuronectes americanus), dab (Hippoglossoides platessoides), gray sole (Glyptocephalus cynoglossus), and yellowtail (Limanda ferruginea) were grouped. By grouping in this manner, it can be seen that the catch rate with the electric field was more than twice (2.04 times) as effective for those species as the catch rate made by the net without the field. In comparing the difference in fishing effectiveness with changes in anode position, the electric catch rate was 2.1 times the nonelectric catch rate when the anodes were on the footrope and 2.39 times the nonelectric catch rate when the anodes were at the headrope. The difference between the two values (2.15 and 2.39) is 0.24 or about 11 percent of the former and 10 percent of the latter. The approximate 10-percent difference might have been due to the directional force of the field. With the anodes on the headrope the directional effect might have brought the fish off of the bottom before they became stunned and drifted back into the net. This is another point needing further investigation and clarification.

A seasonal fishery exists in New England based upon whiting (Merluccius sp.). While the electric catch rate was 4.43 times that of the nonelectric comparative rate, a significant difference in catch rate is apparent between electrical catches with the anodes in different positions. While the anodes were at the footrope, a catch rate of 7.78 fish per tow resulted; a comparative rate of approximately 3.44 resulted from fishing with the anodes at the headrope. The difference between the two values is 4.34 which is 55.76 percent and 126.16 percent of the catch rates, respectively, for the footrope and headrope positions of the anodes while fishing.

DISCUSSION

Many questions concerning the type of tests conducted, the conduct of the tests, and their results may be clarified by the following:

1. Experimental electrical fishing was conducted to determine the fishing effectiveness of the method, i. e., of an electric field (as applied) used as an adjunct to an otter-trawl net (a) in a true marine environment, (b) at commercial trawling depths, and (c) in areas suitable for commercial fishing.

2. The specific electrical equipment used was not subject to testing as a "commercial prototype" because it was experimental in nature and was neither a prototype nor intended to be either suitable or recommended for commercial application. However, positive test results may presumably lead to future development of similar equipment for use by the industry.

3. Commercial quantities of fish and competitive tows with commercial trawlers were neither required nor desirable at this stage of experimentation. It was only required that catch results were sufficiently large to allow for evaluation of the effectiveness of the method.

The effectiveness of the electric field in catching fish such as herring (Clupea harengus), which otherwise escape the large mesh net, suggest an applicability to midwater trawling, off-the-bottom trawling, and other similar types of fishing.

We believe that successful future application of electrical fishing in marine waters will be limited only by the amount of investigational effort expended and the development of equipment appropriate to practical use within specific segments of the fishing industry.

APPENDIX

Details of the electrical equipment are available as an appendix attached to the reprint of this article. Write for Separate No. 734. It contains details on the power source, pulse forming and firing circuits, electrical control panel, auxiliary power source, transmission line, net transformers, modifications during experiments, electrodes, and splices.

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"PUSH" FROM BEHIND MOVES FISH FORWARD IN A SCHOOL

Fish in a school may move forward because of stimuli from behind them--not because they are leading or following a fish in front. This new theory about the movements of fish has been set forth by Dr. Evelyn Shaw, Department of Animal Behavior, American Museum of Natural History, New York City.

After working with hundreds of young atherina fish, similar to the silver-sides, Shaw concludes that each fish in a school moves forward in response to a neighboring fish moving past its eye vision.

As one fish from behind moves, this movement stimulates the fish ahead which moves and triggers the next fish, and so on. In this way the whole school moves forward. As for the last fish, she said, it seems to straggle and lag behind.

Fish can see a wide area on both sides of the body. The vision is almost semicircular, sweeping from mouth to tail. Thus a movement from behind is easily noticed.

Shaw conducted her experiments on different fish of the schooling or social type, such as the common household pet, the tetras, and the zebra fish. She placed tanks of those fish inside a rotating drum which had stripes, usually yellow and black, painted on the inner walls. As the drum was turned, the stripes would move and the fish would be stimulated to move, tending to lead rather than follow the patterns. (Science News Letter, November 14, 1964.)

TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 16-- AN EXPLORATORY FISHING AND GEAR RESEARCH BUOY:

A new unit has been developed and used aboard the exploratory fishing vessels Silver Bay and Oregon of the U. S. Bureau of Commercial Fisheries South Atlantic Exploratory Fishing and Gear Research Station, Brunswick, Ga., and the George M. Bowers of the Gear Research Station, Panama City, Fla.

MATERIALS AND APPROXIMATE COST LIST

Item	Qty	Unit	Unit Price	Total
Pigtail socket	2	ea.	0.22	0.44
Conduit pipe	19	ft.	0.27	5.13
Wire from battery to light	20	ft.	0.02	0.40
Elbow, 45°	2	ea.	0.70	1.40
Styrofoam	7	ft.	0.52	3.64
Radar reflector	1	ea.	3.50	3.50
(address: Vendo Company Kansas City, Mo. Contract No. NU-6468)				
Batteries, 6V., lantern type	2	ea.	1.20	2.40
Cement, sakrete 1/ (50#)	1/2	bag	0.90	0.90
X-condulet, 1"	1	ea.	2.70	2.70
Plywood for box & shield	1/2	sheet	4.00	4.00
Pipe clamps, 1"	1	ea.	0.10	0.10
Brads for box	1	box	0.15	0.15
Clamp & screws	2	ea.	0.35	0.70
Tape	2	roll	1.15	2.30
Fluorescent paint	1	pt.	2.70	2.70
Total				30.46

1/Use of trade names is for identification only and does not imply endorsement of the company or product named.

The new unit meets the need for an inexpensive, reliable, and easily constructed fishing buoy and is adaptable to commercial use. The buoy is used to mark fishing gear in the water, to serve as a reference point for trawling, dredging, and gear research activities. Painted international orange, it has proved suitable for both day and night operations. CAUTION: Attempting to improve daylight visibility of the buoy through addition of a flag to the buoy top may create vibrations during operations which damage the light bulb filaments; however, use of such a flag is not considered necessary under normal operating conditions.



Fig. 1 - New type of exploratory fishing buoy used by Bureau of Commercial Fisheries exploratory fishing vessels to mark fishing gear in the water.

Basic features of the buoy include aluminum conduit, styrofoam flotation, two blinking lights, and fluorescent paint. Construction details are given in the accompanying diagrams (fig. 2, page 13) and list of materials and cost.

--By F. J. Hightower,
Fishery Methods and Equipment Specialist
Pascagoula, Miss., and
A. J. Barrett, Mate, M/V Oregon,
Brunswick, Ga., Exploratory Fishing and
Gear Research Stations,
U. S. Bureau of Commercial Fisheries.

U. S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Sep. No. 735

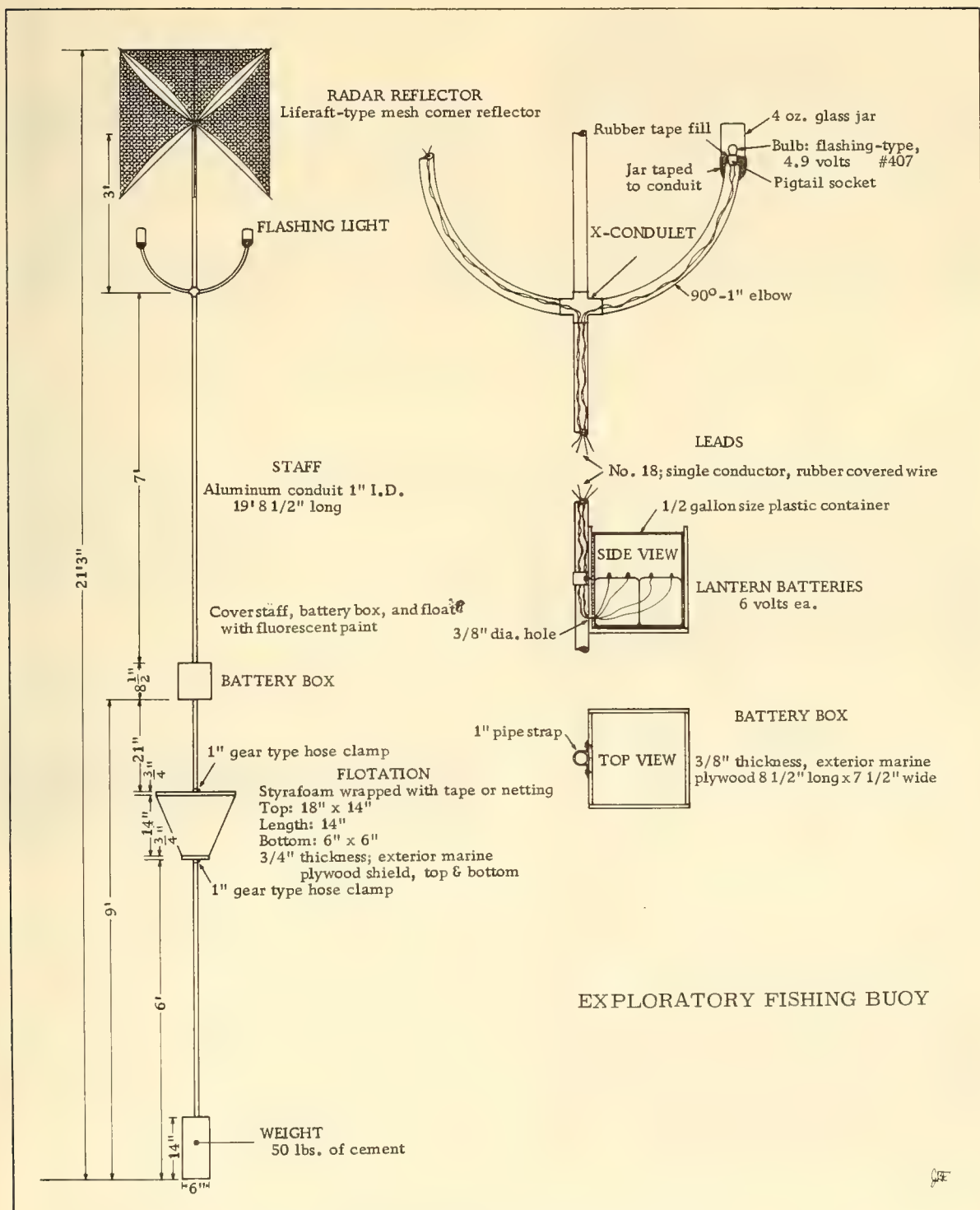


Fig. 2 - Construction details of new exploratory fishing buoy.

Alaska

FOREIGN FISHING ACTIVITY OFF ALASKA, MARCH 1965:

U. S. S. R.: A Soviet trawling fleet of about 100 vessels previously centered off Yakutat in February 1965 shifted southward during March. Early in the month a gradual southeasterly movement began and by mid-March that fleet was centered off Cape Ommaney at the entrance of Chatham Strait and extended nearly to Dixon Entrance. Later, the fleet returned northward, breaking into 2 sections, one centered off Sitka and the other again off Yakutat. Observations showed the fleet was consistently fishing for Pacific ocean perch, with little catch of other species. A Soviet trawler known to be an exploratory fishing vessel was reportedly working west of Cape Flattery, Wash., and fishing for Pacific ocean perch.



Fig. 1 - U.S.S.R. trawler (SRT-R Komandor) offloading Pacific ocean perch to reefer vessel in Bering Sea.

Another Soviet trawling fleet of about 15 vessels, including at least 9 BMRT factory stern trawlers, was operating during March southwest of Kodiak near Chirikof Island. Observations showed that Pacific ocean perch was also the primary objective of that fleet.



Fig. 2 - Soviet king crab factoryship Pavel Chebotnyagin.

During the month, at least 15 Soviet trawlers were engaged in a flounder fishery on the

outer Bristol Bay flats some 20 miles north of Unimak Island. Their catches were reported to be of moderate size and composed of small flatfish.

In addition to the factoryship Pavel Chebotnyagin, two of her sister ships, the Aleksandr Obukov and Konstantin Sukhanov, were also engaged in a tangle-net fishery for king crab in the eastern Bering Sea. The latter two vessels were fishing about 90 miles north of Unimak Island well north of the designated crab pot sanctuary.

The Pavel Chebotnyagin was working in an area closed to tangle-net fishing. But the vessel moved north out of the area on March 29 when she received verification that the area was closed to tangle nets. As in the past, each of the factoryships carried 12 small boats used for picking the crab from the tangle nets.

Japan: The Japanese shrimp factoryship Chichibu Maru and her 9 trawlers have since January 1965 consistently fished in the area north of the Pribilof Islands. About mid-March, 2 of the trawlers attached to that fleet were sighted north of Unimak Island. It was thought that possibly ice conditions forced the fleet to leave the grounds near the Pribilofs.



Fig. 3 - Japanese stern-ramp factory trawler.

Again this year the Japanese factoryships Tokei Maru and Tainichi Maru were engaged in the eastern Bering Sea king crab fishery. Five trawlers are attached to each factoryship to set tangle nets. The Tokei Maru carries 8 small "kawasaki" boats for hauling and picking the nets, and the Tainichi Maru carries 9 such boats. This year (1965), both those fleets will reportedly experiment with pot fishing as well as their typical tangle-net operations. The Tokei and Tainichi fleets were operating during March in outer Bristol Bay north and west of Port Moller somewhat east of Soviet king crab fishing operations.

Japan's factory stern trawlers Akebono Maru Nos. 53 and 71 were during March last

reported northwest of Unimak Pass and were probably fishing for Pacific ocean perch. It was believed that at least 2 other such trawlers, the Aso Maru and Akebono Maru No. 72, were also working in that general area.



Fig. 4 - Japanese supply ship operating in Bering Sea.

Of the 4 Japanese trawlers scheduled to operate in the Gulf of Alaska by May 1965, 3 already were in the area in March. The Dai-shin Maru No. 12 was fishing on Portlock Bank east of Kodiak, the Taiyo Maru No. 82 was on the Albatross Bank southwest of Kodiak, and the Takachiko Maru was working southwest of Unimak Pass. All are factory stern trawlers. The Akebono Maru No. 53 was also scheduled to enter the Gulf of Alaska in March but had so far remained in the Bering Sea.

* * * * *

ALASKA FISHERY CATCH ESTIMATES FOR 1964:

The 1964 commercial catch of fish and shellfish in Alaska during 1964 amounted to some 496 million pounds with an ex-vessel value of \$58.4 million, according to preliminary data of the Alaska Department of Fish and Game. This was an increase of about 104 million pounds and \$12 million over 1963. Landings of several of the more important species are:

Species	Million Pounds	Value
		\$1,000
Halibut	28.0	3,900
Herring	46.6	694
Salmon	312.0	43,140
Dungeness crab	12.7	1,400
King crab	86.7	8,800
Shrimp	7.8	312
Clams (shell weight)	0.1	10
Other	2.0	160
Total	495.9	\$58,416

The 1964 halibut landings were down about 3 million pounds and \$261,000 from 1963. In contrast, herring landings were up 15.4 million pounds and \$226,000. The increased herring catch resulted from the improved market



Fig. 1 - Gill-netter fishing for king salmon.

for herring meal and oil. Salmon landings were up 89 million pounds and \$11.8 million. The salmon increase was primarily in greater landings of chum, pink, and sockeye.

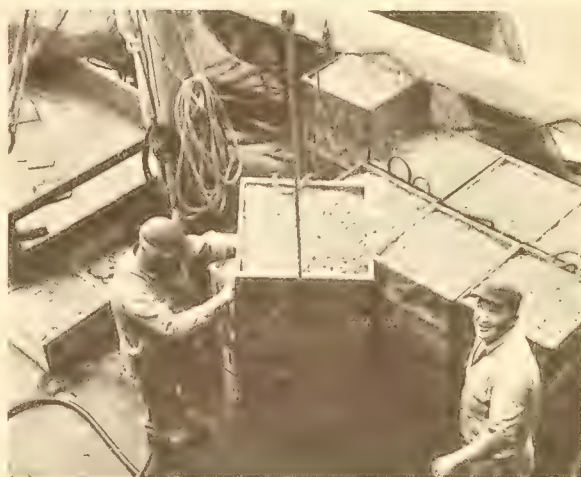


Fig. 2 - Unloading pink shrimp at Wrangell, Alaska.

The Dungeness crab catch was up 600,000 pounds and \$43,000. King crab was up 8 million pounds and \$1.2 million. Shrimp landings dropped 7.3 million pounds and \$293,000. The clam catch was down 310,000 pounds and \$42,000, a drop of over 75 percent from the previous year.

* * * * *

CRAB AND SHRIMP PRODUCTION, 1964:

Alaska's 1964 catches of king and Dungeness crab were the highest in the history of the Alaskan fisheries, according to preliminary data of the Alaska Department of Fish and Game. The king crab catch of 86.7 million pounds was more than 4.5 times the catch

of 5 years earlier and almost 10 times more than 10 years ago. The Aleutian Islands area was the highest producer of crabs in 1964 with a catch of 33.6 million pounds, or double the 1963 catch. The very large increase in that area is attributed to a number of factors, including the increased number of floating processors, the shift of some vessels to the area because of the loss of processing facilities in Kodiak because of tidal wave damage, and the natural growth of the fishery which has been in progress for several years.

Despite the March 1964 earthquake and seismic wave, the Kodiak area was the second highest king crab producer in 1964 with a catch of 29.6 million pounds. The Alaska Peninsula area followed with 15 million pounds and the Cook Inlet area with 6.9 million pounds. The Chignik, Prince William Sound, and Southeastern Alaska areas produced 1.6 million pounds.

Alaska's 1964 Dungeness crab landings of 12.7 million pounds topped the 1963 record catch by 600,000 pounds. Southeastern Alaska was the highest producer with 4.6 million pounds. The Kodiak area was a close second with 4.3 million pounds, almost double the amount produced in 1963. The 3.4 million pounds caught in the Prince William Sound-Copper and Bering Rivers area was 150,000 pounds more than in 1963, and the Cook Inlet catch totaled 400,000 pounds.

The Alaska shrimp catch dropped from 15.1 million pounds in 1963 to 7.8 million pounds in 1964. The lower 1964 shrimp landings were not due to a resource scarcity, but a combination of loss of processing facilities and unfavorable market conditions.

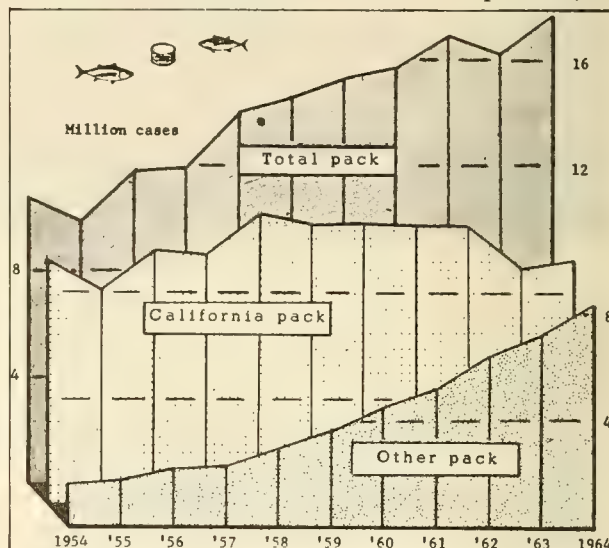
The Alaska Department of Fish and Game pointed out that the continued increase in shellfish production is of special significance to Alaska's economy. Fishermen received about \$10.5 million for their 1964 landings and about another \$10 million was paid to workers in processing the catch. Income from the growing year-round fishery industries is of vital importance to Alaska, and particularly its coastal communities, the Department's Commissioner stated.



Canned Fishery Products

U.S. PACK, 1964:

The 1964 pack of canned fishery products in the United States, American Samoa, and Puerto Rico by 322 plants amounted to 35.2 million standard cases (1.1 billion pounds)



U.S. canned tuna pack, 1954-64.

U.S. Pack of Canned Fishery Products, 1964					
PRODUCT	NUMBER OF PLANTS	STANDARD CASES	POUNDS PER CASE	TOTAL POUNDS	VALUE
CANNED FISHES:					
FOR HUMAN CONSUMPTION:					
SALMON:	136	3,745,307	48	179,774,736	\$94,057,397
SARDINES:	23	865,751	23.4	20,256,573	7,561,621
TUNA:	7	120,800	45	5,436,250	1,029,903
SOLID:	32	4,519,398	21	94,907,156	61,011,659
CHUNKS:	29	11,915,938	19.5	232,360,635	147,213,251
FLAKES AND GRATED:	26	1,253,677	18	22,566,186	9,369,701
TOTAL:	1/ 35	17,689,005	-	349,634,170	217,565,651
TOMATO FISH:	5	24,074	21-19.5-18	466,743	177,062
ALBUQUERQUE:	8	74,581	45	3,355,145	260,402
MACKEREL:	9	1,070,623	45	48,187,035	6,760,340
SHAD:	5	3,238	45	145,725	10,100
FISH CAKE (PRINCIPALLY GROUND FISH):	34	67,372	48	2,997,856	648,097
GULF TILAPIA:	5	311,994	45	14,173,702	5,095,322
SALMON, SMOKED:	14	1,840	48	88,320	142,200
STICKLEBACK, SMOKED AND SPREADS:	35	1,040	48	49,920	61,655
TUNA, SPECIALTIES:	7	8,213	48	394,224	99,705
SMOKED, CREAMED AND SPREADS:	3	48,341	48	2,320,368	692,694
ANCHOVY PASTE:	4	1,068	48	51,264	73,375
MISCELLANEOUS FISH SPECIALTIES:	4	110,380	48	5,296,240	1,305,963
FISH ROE AND CAVIAR:	14	64,042	48	3,074,016	2,202,493
TOTAL FISH:	-	24,199,476	-	636,519,236	339,212,223
CRAB MEAT:	30	292,314	19.5	5,700,123	7,553,034
CRAB MEAT SPECIALTIES:	10	16,459	48	790,032	256,537
LOBSTER MEAT AND SPECIALTIES:	6	15,107	48	725,156	301,562
SHRIMP SPECIALTIES:	33	645,332	15	9,729,980	12,217,340
CLAMS AND CLAM PRODUCTS:	11	15,235	48	729,200	245,671
WHOLE:	6	15,249	15	228,735	726,315
MINCED:	23	563,252	18	3/ 8,449,380	6,447,368
CHOWDER:	17	1,115,252	30	3/33,466,560	7,439,075
JUICES:	12	121,451	30	3/ 3,643,530	986,663
TOTAL:	1/ 41	1,915,544	-	3/45,788,205	14,715,452
CLAM SPECIALTIES:	16	65,350	48	3,136,800	1,189,605
COCHINEAL:	3	9,597	48	459,556	182,785
ONIONS:	20	422,261	14	3/ 5,911,654	5,291,680
ONION SPECIALTIES:	7	307	48	14,736	27,949
SHEDS:	6	113,169	48	5,432,112	2,040,954
WISCONSIN AND SOUP:	7	2,650	48	127,020	48,211
SOUP:	9	214,649	48	10,303,152	597,484
WISCONSIN AND SOUP:	9	17,943	48	810,564	271,135
MISCELLANEOUS SHELLFISH SPECIALTIES:	9	13,327	48	639,696	162,405
TOTAL SHELLFISH:	-	3,635,434	-	89,967,146	46,142,530
TOTAL FOR HUMAN CONSUMPTION:	-	27,834,910	-	726,506,382	395,254,613
BAIT AND ANIMAL FOOD:					
ANIMAL FOOD:	56	7,341,670	48	352,400,160	43,470,700
SALMON EGGS FOR BAIT:	9	21,900	-	1,031,480	2,163,995
TOTAL BAIT AND ANIMAL FOOD:	1/ 65	7,363,570	-	353,431,640	45,634,695
GRAND TOTAL:	1/ 322	35,218,486	-	1,079,938,020	430,589,508

1/ EXCLUSIVE OF DUPLICATION.

2/ DRAINED WEIGHT.

3/ "CUT OUT" OR "DRAINED" WEIGHTS OF CAN CONTENTS ARE GIVEN FOR WHOLE OR MINCED CLAMS, AND NET CAN CONTENTS FOR OTHER CLAM PRODUCTS.

NOTE: LISTS OF CANNERS OF FISHERY PRODUCTS BY INDIVIDUAL COMMODITIES MAY BE OBTAINED FROM THE OFFICE OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D.C. 20210.

valued at \$431.0 million to the packers. Compared with 1963, the pack was up 648,000 cases and \$9.4 million. The gain resulted mainly from a record pack of tuna and increases in the pack of salmon and animal food.

The 1964 pack for human consumption; (726.5 million pounds) was 2.4 million pounds less than in 1963 while the pack of bait and animal food (353.5 million pounds) was 46.5 million pounds more.



Cans--Shipments for Fishery Products, January-February 1965

A total of 414,359 base boxes of steel and aluminum was consumed to make cans shipped to fish and shellfish canning plants in January-February 1965 as compared with 353,854 base boxes used during the same period in 1964.



Note: Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans are derived by use of the factor 23.7 base boxes per short ton of steel. (In the year 1964 tonnage data were based on the factor 23.5 base boxes per short ton of steel; and in the years 1962 and 1963 tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.



Central Pacific Fisheries Investigations

SKIPJACK TUNA BIOLOGICAL STUDIES CONTINUED:

M/V "Charles H. Gilbert" Cruise 79 (February 10-March 10, 1965): To collect biological data on skipjack tuna (aku) and other related studies was the objective of this cruise by the research vessel Charles H. Gilbert, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Honolulu, Hawaii. The areas of operation were south and northwest of the Hawaiian Islands--Area 1 approximately 10°-12° N. and 158°-149° W., and Area 2 between 24°-20° N. and 170°-158° W.

During the cruise, blood and serum samples of 70 skipjack and 5 yellowfin tuna were taken from fish landed from a single school successfully fished 8 miles northwest of Kau-



Fig. 1 - Charles H. Gilbert, research vessel of the U.S. Bureau of Commercial Fisheries. Note underwater observation chamber at the bottom of the bow end.

la Island. Also, large volume tuna whole blood samples were taken from 22 skipjack and 5 yellowfin tuna for use as standards in future reagent development studies by the Bureau's Honolulu Biological Laboratory.

Measurements and sex determinations were made for the 70 skipjack and 5 yellowfin sampled from the school off Kaula Island. All of the fish were judged immature with the skipjack ranging from 43.1 to 57.9 centimeters (about 16.9 to 22.8 inches) and the yellowfin ranging from 66.7 to 75.9 centimeters (about 26 to 29.9 inches).

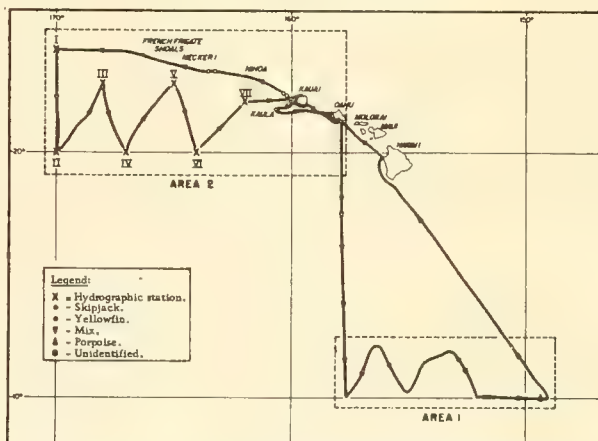


Fig. 2 - Shows area of operations of Charles H. Gilbert Cruise 79 (February 10-March 10, 1965).

Six skipjack schools, 2 yellowfin schools, 2 mixed schools (skipjack-yellowfin), 1 porpoise school, and 1 unidentified school were observed. Only one skipjack tuna school was observed and that was in Area 1. The other schools were spotted along the cruise track to the areas. The single successful fishing

effort of the cruise was accomplished by trolling. Since the fish did not respond to chumming attempts, the specimens taken were the results of 5 hours of continuous trolling.

Oceanographic operations of the cruise included making 270-meter (886 feet) bathythermograph (BT) casts and taking surface temperature and salinity samples every 3 hours while under way and after each successful fishing effort. Surface salinity samples, temperatures, and BT casts were also made every 3 hours while under way and following the single successful fishing effort, and standard weather observations were made.

Drift cards were released every 3 hours at BT stations while beyond 25 miles of land and hourly within 25 miles of land. Seven oceanographic stations were occupied, each involving a single 300-meter (984 feet) cast with 8 Nansen bottles placed at various depths.

A total of 5 yellowfin tuna and 2 little tuna were returned alive to the Honolulu Biological Laboratory for behavior studies.

Note: See Commercial Fisheries Review, February 1965 p. 16.

* * * * *

SKIPJACK TUNA BLOOD GROUP STUDIES:

Blood and serum samples taken from 70 skipjack and 5 yellowfin tuna caught by the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert (Cruise 79) were returned early in April 1965 to the Bureau's Biological Laboratory, Honolulu, Hawaii, for tuna blood group studies. The fish had been caught in one day's fishing northwest of Kaula Island in the Hawaiian Islands group during the research vessel's February-March 1965 cruise.

Such blood samples are used to tell whether fish come from a single subpopulation or from several. Much the same as humans and other animal life, fish can be divided into subpopulations by the prevalence of blood types among them.

According to the Director of the Bureau's Honolulu Biological Laboratory, finding out how many subpopulations exist among the various fish species is more than an interesting intellectual puzzle. The skipjack tuna (aku) is by far Hawaii's most important commercial fishery. That same species of tuna is caught in great numbers off the west coast of North America. If that fishery were sharp-

ly stepped up, as has been suggested, would the Hawaiian fishery decline? The answer lies in part in whether the fish all come from the same subpopulation.

The blood samples were taken to the Tuna Blood Group Center at the Bureau's Laboratory's headquarters on the edge of the University of Hawaii campus and analyzed. The Bureau scientists found that the skipjack tuna caught by the research vessel came from a distinct subpopulation they are calling Type Two, and that it seems to be found in Hawaiian waters throughout the year. Whether it is spawned and spends its life in those waters is as yet unknown. Some skipjack tuna spawning has been observed in Hawaiian waters, and has also been found near the Line Islands and the Marquesas.

One scientific theory holds that the skipjack population is much like that of Honolulu. It may consist of residents and visitors. The very large skipjack landings during summer could reflect that fact. But so far, of the million or more skipjack tuna landed in Hawaii every year, the "last known residence" of only two fish has been confirmed. Those were skipjack tagged off the coast of Baja California in 1960 and caught in Hawaiian waters in 1962.

Cruise 79 of the research vessel Charles H. Gilbert is the first of several designed to discover what subpopulations are in the local waters at different times of the year. In planning that cruise, the scientists took a leaf from the fishermen's book. Fishermen let bird flocks lead them to fish schools. The Bureau's Honolulu Biological Laboratory drew on several years' records of bird flock sightings to lay out the cruise. Two areas were investigated during the cruise, one to the southeast of the Islands and the other to the northwest. The first of those areas contains waters of the California Current Extension, which is suspected of playing a large role in the introduction of skipjack tuna into the Hawaiian fishery during the spring and summer. The second area has been known to have, during various times of the year, numerous skipjack schools. How the different types of waters around Hawaii interact and how they respond to the wind systems is the object of a major study at the Bureau's Honolulu Biological Laboratory, viz., the Trade Wind Zone Oceanography Program.

Note: See Commercial Fisheries Review, April 1965 p. 18.



Federal Purchases of Fishery Products

DEFENSE DEPARTMENT'S NEW INSPECTION REQUIREMENTS FOR FROZEN RAW BREADED FISH PORTIONS:

New inspection requirements, effective June 1, 1965, for frozen raw breaded fish portions purchased by the U. S. Department of Defense were announced in Headquarters Notice to the Trade No. 25 (65) of March 17, 1965, issued by the Defense Subsistence Supply Center, Chicago, Ill.

The new inspection requirements are contained in DSSC Articles 341 of June 1, 1965 (which replace DSSC Articles 341 of July 1, 1964) and will be cited in DSSC contracts for fish portions awarded on and after June 1, 1965.

Copies of the revised inspection requirements for fish portions may be obtained from regional offices of the Defense Subsistence Supply Center.

* * * * *

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MARCH 1965:

Fresh and Frozen: Purchases of fresh and frozen fishery products in March 1965 for the use of the Armed Forces were up 12 percent in quantity and 18 percent in value from the previous month. The increase was due mainly to larger purchases of higher-priced items such as shrimp, scallops, and haddock portions.

Compared with the same month in 1964, purchases in March 1965 were down 5 percent in quantity, but up 25 percent in value. Average prices for shrimp and scallop purchases in March 1965 were up sharply from March 1964, and prices for most fish fillet items were also higher.

Table 2 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, March 1965 with Comparisons

QUANTITY				VALUE			
March		Jan.-Mar.		March		Jan.-Mar.	
1965	1964	1965	1964	1965	1964	1965	1964
..... (1,000 Lbs.) .....				..... (\$1,000)			
2,272	2,382	6,678	6,790	1,550	1,236	4,326	3,555

Total purchases in January-March 1965 were down 2 percent in quantity, but up 22 percent in value from those in the same period of 1964. Haddock portions were purchased in much larger quantity during the first quarter of 1965, but the increase was offset by smaller purchases of scallops, eastern oysters, flounder fillets, and haddock fillets.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, March 1965 with Comparisons

Product	QUANTITY				VALUE			
	March		Jan.-Mar.		March		Jan.-Mar.	
	1965	1964	1965	1964	1965	1964	1965	1964
..... (1,000)								
Tuna	1,548	529	2,189	1,457	650	236	941	644
Salmon	2	-	8	679	2	-	7	416
Sardine	35	19	146	79	20	8	89	30

Canned: Sizable lots of canned tuna were purchased for the Armed Forces in both January and March 1965. Canned sardines were

Table 1 - Principal Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, March 1965 with Comparisons

Product	March				Jan.-Mar.	
	1965		1964		1965	1964
	Quantity	Avg. Cost	Quantity	Avg. Cost	Quantity	Quantity
	Pounds	Cents/Pound	Pounds	Cents/Pound	..... (Pounds)	
Shrimp:						
raw headless	92,400	98	99,150	79	276,800	282,050
peeled and deveined	165,500	141	46,472	106	319,660	231,222
breaded	326,500	88	348,900	65	929,920	979,200
molded and breaded	60,650	66	107,300	58	155,900	115,000
Total shrimp	645,050	101	601,822	69	1,682,280	1,607,472
Scallops	217,304	85	299,900	54	538,884	691,000
Oysters:						
Eastern	68,718	97	121,530	101	207,490	326,918
Pacific	35,426	80	21,676	64	97,652	73,806
Total oysters	104,144	91	143,206	95	305,142	400,724
Fillets:						
Cod	41,520	36	22,700	34	156,270	127,246
Flounder	178,050	38	316,000	37	802,500	1,173,816
Ocean perch	313,500	34	348,520	30	1,008,290	1,011,120
Haddock	183,550	37	217,650	32	455,550	569,244
Haddock portions	188,504	47	-	-	498,054	8,650
Steaks:						
Halibut	113,770	51	112,500	37	322,420	307,025
Salmon	18,250	64	25,735	67	32,740	49,302
Swordfish	400	62	2,610	56	1,260	5,310

also purchased in moderate quantity during the first quarter of 1965.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than shown because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, May 1965 p. 17.



Fish Sticks and Portions

U. S. PRODUCTION, 1964:

The United States production of fish sticks and portions during 1964 amounted to 179.2 million pounds valued at \$66.3 million--a gain of 3 percent in quantity and 1 percent in value as compared with 1963. Fish sticks totaled 73.5 million pounds in 1964--5.8 million pounds or 7 percent below 1963, and fish portions amounted to 105.6 million pounds--up 11.0 million pounds or 12 percent.

Table 1 - U. S. Production of Fish Sticks by Months and Type, 1964 1/

Month	Cooked	Uncooked	Total
. . . (1,000 Lbs.). . .			
January	6,709	517	7,226
February	6,595	467	7,062
March	6,417	548	6,965
April	5,468	403	5,871
May	5,251	406	5,657
June	3,700	521	4,221
July	3,398	407	3,805
August	5,675	630	6,305
September	5,944	533	6,477
October	6,683	343	7,026
November	5,749	398	6,147
December	6,221	549	6,770
Total quantity: 1964 1/	67,810	5,722	73,532
1963 -	74,137	5,165	79,302
Total value: 1964 1/	27,997	1,974	29,971
1963 -	29,734	1,856	31,590

1/Preliminary.

Table 2 - U.S. Production of Fish Sticks by Months, 1960-64

Month	1964	1963	1962	1961	1960
. . . (1,000 Lbs.). . .					
January	7,226	7,554	6,082	6,091	5,511
February	7,062	8,241	6,886	7,097	6,542
March	6,965	8,053	7,658	7,233	7,844
April	5,871	6,546	5,719	5,599	4,871
May	5,657	5,750	5,643	5,129	3,707
June	4,221	6,125	5,117	4,928	4,369
July	3,805	4,870	3,740	3,575	3,691
August	6,305	5,696	5,760	6,927	5,013
September	6,477	5,865	6,582	5,206	5,424
October	7,026	8,128	6,698	6,133	6,560
November	6,147	6,471	6,305	6,288	6,281
December	6,770	6,003	6,027	5,618	5,329
Total	73,532	79,302	72,217	69,824	65,142

1/Preliminary.

Table 3 - U.S. Production of Fish Sticks by Areas, 1964 and 1963

Area	1/1964		1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	23	57,375	24	64,205
Inland & Gulf States	7	8,269	7	8,316
Pacific Coast States	12	7,888	13	6,781
Total	42	73,532	44	79,302

1/Preliminary.

Table 4 - U.S. Production of Fish Portions by Months, 1964 1/

Month	Cooked	Breaded Uncooked	Total	Un-breaded	Total
. . . (1,000 Lbs.). . .					
January	1,540	7,022	8,562	258	8,820
February	1,742	6,279	8,021	420	8,441
March	2,111	6,408	8,519	185	8,704
April	1,950	5,905	7,855	105	7,960
May	1,722	5,675	7,397	168	7,565
June	1,219	6,227	7,446	169	7,615
July	774	5,665	6,439	105	6,544
August	1,711	7,375	9,086	255	9,341
September	2,544	7,100	9,644	129	9,773
October	2,033	8,739	10,772	293	11,065
November	1,742	8,921	10,663	201	10,864
December	1,868	6,819	8,687	253	8,940
Total qty. 1964 1/	20,956	82,135	103,091	2,541	105,632
Total qty. 1963 -	16,623	74,967	91,590	3,054	94,644
Total value 1964 1/	8,667	26,712	35,379	910	36,289
Total value 1963 -	6,846	26,099	32,945	1,035	33,980

1/Preliminary.

Table 5 - U. S. Production of Fish Portions by Areas, 1964 and 1963

Area	1/1964		1963	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	26	63,955	27	53,211
Inland & Gulf States	9	38,981	10	38,222
Pacific Coast States	11	2,696	11	3,211
Total	46	105,632	48	94,644

1/Preliminary.

Table 6 - U.S. Production of Fish Portions by Months, 1960-64

Month	1/1964	1963	1962	1961	1960
. . . (1,000 Lbs.). . .					
January	8,820	8,173	5,077	4,303	3,632
February	8,441	7,361	6,360	4,902	3,502
March	8,704	8,835	7,036	5,831	4,706
April	7,960	7,919	6,408	4,484	3,492
May	7,565	7,293	5,818	3,879	3,253
June	7,615	8,774	6,137	4,039	3,995
July	6,544	4,524	4,679	3,962	4,088
August	9,341	6,684	6,687	4,963	3,558
September	9,773	9,621	7,180	5,745	4,631
October	11,065	9,877	9,871	6,759	5,275
November	10,864	8,136	7,406	5,789	4,790
December	8,940	7,447	6,019	5,191	4,459
Total	105,632	94,644	78,678	59,847	49,381

1/Preliminary.

Cooked fish sticks (67.8 million pounds) made up 92 percent of the 1964 fish stick total, while the remaining 5.7 million pounds or 8 percent consisted of raw fish sticks. A total of 103.1 million pounds of breaded fish

portions (of which 82.1 million pounds were raw) and 2.5 million pounds of unbreaded portions were processed during 1964.

The Atlantic Coast was the principal area in the production of both fish sticks and fish portions with 57.4 and 64.0 million pounds, respectively. The inland and Gulf States were next with 8.3 million pounds of fish sticks and 39.0 million pounds of fish portions. The Pacific Coast States made up the remaining 10.5 million pounds of fish sticks and fish portions.



Fur Seals

PRICES FOR ALASKA SKINS AT SPRING 1965 AUCTION:

The spring auction in 1965 (April 8-9) of United States Government-owned fur seal skins netted \$1.67 million (does not include value of 2,237 sheared skins). The average price per skin received for 6,079 male fur seal skins (dyed Black, Kitovi, and Matara) was \$116.36 and 7,650 female skins (dyed Black, Kitovi, and Matara) it was \$89.21.



Stripping pelt from Alaska fur seal carcasses at killing field on St. Paul Island.

At the fall 1964 auction, the average price per skin (dyed Black, Kitovi, and Matara) for male fur seal skins was \$85.56 and for female skins it was \$64.34. Of a total of 10,770 Black skins sold at the October 1964 auction, 7,971 were male and the average price was \$91.58 per skin; 2,799 were female and the average price for those was \$64.38 per skin. At the spring 1964 auction, the three colors of male skins brought an average price of \$105.45 per skin, a considerably higher average price than was received at that year's fall auction.

The average price received for both male and female fur seal skins (dyed Black, Kitovi, and Matara) at this year's spring auction was \$101.24 per skin. Lakoda (female sheared) seal skins brought an average price of \$47.68 each, much less than the average of \$59.65 received at the fall 1964 auction, and only slightly below the average of \$48.82 received at the spring 1964 auction.

Average prices per skin received for processed male fur seal skins at the spring 1965 auction were: Black \$121.23; Kitovi \$92.81; and Matara \$116.63. Average prices for both male and female dyed skins at this year's spring auction were (average for fall 1964 auction in parentheses): Black \$104.03 (\$84.51); Kitovi \$83.91 (\$62.49); Matara \$101.86 (\$75.89). At the spring 1964 auction the average prices for both male and female dyed skins were: Black \$92.47, Kitovi \$81.66, and Matara \$91.58 per skin.

Note: See *Commercial Fisheries Review*, December 1964 p. 40; June 1964 p. 15.



Great Lakes Fishery Investigations

CHEMICAL TREATMENT OF SEA LAMPREY-PRODUCING STREAMS IN 1965:

Plans of the U. S. Bureau of Commercial Fisheries to treat 52 sea lamprey-producing streams in northern Michigan starting in spring 1965 through June 30, 1966, were approved this past April by the State of Michigan Conservation Department. A permit issued by Michigan's Conservation Director authorized that Federal agency to apply a selective sea lamprey-killing chemical under rigid safety standards in 20 Lake Superior streams and 32 tributaries of Lake Michigan.

The series of treatments were scheduled to get under way as soon as the run-off from melting snow ended, with stream work beginning in late April in the Lower Peninsula, and the season's first treatments above the Straits about early May. Stream conditions permitting, Stoney Creek in Oceana County was scheduled to be the first in the spring of 1964 to receive chemicals for eradicating sea lampreys. Otherwise, chemical treatment would be started farther south in Van Buren County.

Lake Superior streams on the chemical treatment list include: Gratiot and Little Gratiot Rivers in Keweenaw County; Three Mile Creek, Little Two Heart River, and Two Hearted River in

Luce County; Harlow Creek and Garlic and Little Garlic Rivers, in Marquette County; and Betsy River in Chippewa County; Sullivan Creek, Hurricane River, Miners River, Anna River, Five Mile Creek, Au Train River, Sucker River, Beaver Lake outlet, Rock River, Furnace Creek and Deer Lake outlet in Alger County.

This marks the first chemical treatment attack on sea lampreys in Gratiot and Hurricane Rivers. All of the other waters have been treated before, but stream studies show that sea lamprey populations have come back in them. The scientist in charge of the U. S. Bureau of Commercial Fisheries sea lamprey control program said, "Although re-treatment is necessary in these waters, there is no doubt in our minds that we have made a major breakthrough in controlling lamprey in Lake Superior streams. Lamprey catches at our electric barriers reveal that the predators' population has been reduced 80 percent during the last three years in the lake's treated tributaries." Even more significant to the total effort of restoring Lake Superior's fishery is the improvement in the survival and growth of lake trout, according to the scientist in charge of the program.

The following tributaries of Lake Michigan will also receive attention under the Michigan Conservation Department's latest permit for chemical treatment. They are Fishdam and Little Fishdam Rivers, Ogontz River, and Valentine Creek in Delta County; Milakokia River, Marblehead Creek, Deadhorse Creek, and Bursaw Creek in Schoolcraft County; Hudson Creek, Crow River, Hog Island Creek, Sucker Creek, Rock River, Cataract River, Swan Creek, and Point Patterson Creek in Mackinac County; Carp Lake River, Big Stone Creek, Big Sucker River, and Wycamp Outlet in Emmet County; White River and Norris Creek in Muskegon County; Black River and Brandywine Creek in Van Buren County; Porter Creek, Jordan River, Loeb Creek, McGeach Creek, Horton Creek, and Monroe Creek in Charlevoix County; Stoney Creek in Oceana County; and Grand River in Ottawa County.

Of the Lake Michigan tributaries, Little Fishdam River, Crow River, Carp Lake River, Wycamp outlet, White River, Norris Creek, Black River, Brandywine Creek, Monroe Creek, Stoney Creek, and Grand River would be treated for the first time. The remaining Lake Michigan streams will be phased into a four-year cycle of re-treatment which is

geared to destroying reestablished sea lampreys before they have a chance to become parasitic. Normally those eel-like predators reach that stage in their fourth year. The Bureau's scientist in charge of the program reports that good gains have also been made in lowering sea lamprey numbers in treated Lake Michigan streams. If everything goes according to schedule, the first round of treatment of Lake Michigan's lamprey streams will be completed by the end of 1966.

With the progress of those efforts moving so well, the decision has been made to plant 1.3 million yearling lake trout in upper Lake Michigan during summer 1965 to launch the restocking program in those waters.

Under the scheduled timetable, the U. S. Bureau of Commercial Fisheries hopes, after June 1966, to extend its chemical treatment attack on sea lampreys to the Lake Huron area, where 48 streams have been singled out for treatment.

Note: See Commercial Fisheries Review, March 1965 p. 47, December 1964 p. 42.



Gulf Fishery Investigations

Some of the highlights of studies conducted by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., during January-March 1965:

SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies: In an effort to determine optimum conditions for their growth, four diatoms, three flagellates, and three dinoflagellates, used as food for larval shrimp, were each cultivated in 10 ml. of 9 different media. Periodic checks revealed that the degree of cell multiplication varied with the species tested, but that each organism produced the greatest number of cells in Miquel's sea water with soil extract added; "NH" artificial medium proved second best. No growth was observed in sea-water controls.

The various media were also inoculated at different time intervals to develop a schedule of reinoculation that would sustain vigorous cultures. Culture viability differed greatly between species except that all cultures in Miquel's solution with soil extract maintained good growth with weekly reinoculation.

Examination of 103 Gulf-V plankton samples collected in September and October 1963 revealed planktonic-stage penaeids to be approximately three times more abundant in the western (Galveston-Brownsville) than in the eastern (Galveston-Mississippi River) portion of the sampling area. Overall abundance of those forms increased only slightly from that observed in July and August.



Fig. 1 - Sampling postlarvae with a small beam trawl.

Planktonic stages of commercially-important shrimp (*Penaeus* spp.) also were three times more abundant in the western sector than in the eastern, with only a slight overall increase in abundance from that observed during the preceding 2 months. Greatest concentrations occurred at 15- and 25-fathom stations. The relatively high incidence of naupliar and protozoal stages indicates that spawning was intensive throughout the sampling area.

Further attempts (November 1964-February 1965) to locate offshore bottom concentrations of *Penaeus* spp. postlarvae moving into nursery areas were unsuccessful. Sampling 5 to 8 inches above the bottom with a modified Clarke-Bumpus sampler attached to a sled resulted in large catches of postlarval and juvenile *Trachypeneus* spp. and *Sicyonia* spp.

Analysis of fish samples collected during monthly shrimp survey cruises January-June 1964 was completed. It shows that the catch of finfish per unit of sampling effort at all depths was approximately 2 to 4 times greater off Louisiana than off Texas. In our initial consideration of questions about interrelationships of the Gulf's shrimp and demersal fish resources, preliminary analysis of 1963 trawl data has revealed that in depths of 15 and 25 fathoms off Louisiana catches of longspine porgies were $1\frac{1}{2}$ times greater in all areas of high brown shrimp density (100 per 1-hr. tow) than in areas where brown shrimp were not as abundant. A similar appraisal of white shrimp and croaker catches in shallower waters indicated no comparable relationship.

Cultivation of Shrimp under Seminatural Conditions: This project was initiated the previous quarter. Its objectives are: (1) to determine the feasibility of culturing shrimp under seminatural conditions; (2) to evaluate the importance of such factors as population density, predation, nature and abundance of food, dissolved O₂, pH, nitrates, nitrites, ammonia, inorganic phosphate, chlorophyll, salinity, and temperature; and (3) to establish the relative costs of building, operating, and maintaining culture ponds.

Stocking of the pilot study's two $\frac{1}{8}$ -acre ponds at East Lagoon began as the quarter came to a close. Plans are to introduce approximately 9,000 postlarval brown shrimp into each. For comparative purposes, the water in one pond will be changed continuously and the shrimp it contains will be fed daily with a prepared diet. In the other, water will be added only to compensate for that lost through evaporation, and its fertility and pH will be adjusted so as to promote the growth of plankton for natural food.

Florida Bay Ecology Studies: Development of equipment for quantitatively sampling postlarval and juvenile pink shrimp in Florida Bay was continued. Results of testing a suction dredge, which employs the aspirator (or Venturi) principle, appear quite promising. In this method, an area of bottom is enclosed and the entrapped animals, plants, and substratum are lifted by the dredge directly onto graded sorting screens. No water passes through the pump in the process.

Because of this gear's limitations when it is employed to sample from enclosed areas, the suction head assembly was mounted on a sled, which permitted it to be towed over a known distance. In preliminary tests of the "sled's" sampling efficiency versus that of a small beam trawl sweeping an equal area, the sled-mounted suction device caught an average of 14 penaeid shrimp per square meter whereas the beam trawl captured less than 2.

As part of this study, marine plants and animals from the Florida Bay area are being collected, identified, and preserved or mounted for reference. One of the study's major objectives is to relate the role of associated plants and animals to the growth, survival, and distribution of pink shrimp.

Juvenile Phase of the Life History of the Pink Shrimp: Sampling in Buttonwood Canal to determine the cross-sectional distribution of migrating shrimp was conducted with 13 small conical nets (same mesh as channel net) set across the channel at various depths. Sampling proceeded during new-moon, full-moon, and (one) quarter-moon phases. Preliminary analysis of data collected July-December 1964 shows that shrimp tend to concentrate at the surface with less variation from catch to catch during full moon. These observations help to explain the marked differences in earlier abundance estimates derived from samples collected in wing nets without regard to moon phase.

Comparison of data obtained February and March (1965) revealed close agreement between the numbers of shrimp caught in wing and channel nets. If the remaining experimental work gives similarly favorable results, catches in wing nets alone will suffice to estimate the total number of shrimp moving through the canal during periods of full moon. (Conducted by University of Miami under a Bureau contract.)

SHRIMP DYNAMICS PROGRAM: Surveys of Postlarval Abundance and Fisheries for Bait (Juvenile) Shrimp: In contrast to their virtual absence in samples collected during past winters, postlarvae were caught regularly in limited numbers throughout the quarter at Aransas Inlet, Galveston Entrance, Rollover Pass, and Sabine Pass. The persistence of postlarvae at these sampling sites may have been related to above-average water temperatures this winter.

A special study at Rollover Pass in late March provided additional information on factors influencing the movement of postlarvae into nursery areas. Samples were taken hourly over three complete tidal cycles (72 hours) by means of a $\frac{1}{2}$ -m. plankton net fitted with a flow meter. One of the first samples, collected during a 2-minute tow, contained over 5,500 postlarval brown shrimp.

For the first winter since 1961, local sport fishing enthusiasts enjoyed an uninterrupted supply of bait shrimp.

Bait Shrimp Harvests from Galveston Bay System, 1959-1964					
Year	Production Pounds	Effort Hours	Species Composition		
			White	Brown	Other
			..... (Percent)		
1964	846,600	23,010	69	30	1
1963	994,640	29,120	61	39	1/
1962	1,062,900	33,610	57	43	
1961	731,200	25,310	49	51	"
1960	943,400	16,030	59	41	"
1959	504,378	11,715	68	32	"

1/ Less than 1 percent.

Migrations, Growth, and Mortality of Commercial Shrimp: A mark-recapture experiment with pink shrimp was initiated in mid-January on the Tortugas grounds off southwest Florida. The experiment's objectives are to secure information on: (1) patterns of pink shrimp dispersal over the fishing grounds; (2) shrimp growth rates during the period January-March; (3) estimates of natural and fishing mortality; and (4) a measure of the variation associated with estimates of natural mortality.

Approximately 12,000 distinctively stained shrimp of restricted size were released--3,000 in each of four areas--along the eastern margin of the Tortugas grounds. By the end of March, 48 percent of the marked shrimp had been recovered. Tests to determine the proportion of nondetected stained shrimp passing through processing plants were conducted at Key West and Marathon, Fla.

Population Studies: Two cruises scheduled to obtain additional information on the escapement of shrimp from fishing trawls were interrupted by poor weather during the quarter. Other project activities included analysis of data gathered during past cruises and preparation for future work. Some problems encountered in determining escapement from parts of shrimp trawls other than the cod-end have been successfully resolved by simultaneously towing three nets constructed with different-size webbing, and comparing the size frequencies of resulting catches. Similar experiments also permitted comparison of escapement from cod-ends without covering meshes. Findings yielded by both approaches suggest that significant losses of shrimp of commercial size occur when meshes larger than 2 inches are used in either the cod-end or body of shrimp trawls.

Seasonal Changes in Indices of Abundance of Postlarval Brown and White Shrimp in Vermilion Bay, La.: Work during the quarter was divided between processing samples of postlarvae collected during a 96-hour study at Marsh Island, and routine sampling in Vermilion and Cote Blanche Bays. Analyses of data gathered in both bays during 1963 and 1964 suggest a close relationship between the preseason density of postlarvae and the subsequent abundance of harvestable white shrimp. Peak densities of the two groups were separated by about a month, indicating relatively rapid shrimp growth. (Conducted by University of Southwestern Louisiana under a Bureau contract.)

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: The Atlantic Croaker and the bay anchovy contributed significantly to trawl samples collected during the quarter. Since young-of-the-year croaker first entered the estuary last November, their

numbers have steadily increased. Anchovy abundance, on the other hand, has declined by more than 90 percent over approximately the same period. A small number of white and brown shrimp remained in the estuary all winter. This phenomenon was not observed in past winters when freezing or near-freezing temperatures effectively precluded the overwintering of shrimp.



Fig. 2 - Bringing a sample trawl in Galveston Bay on board the Tommy Box, a 40-foot vessel used by the staff of the Galveston Fishery Biological Laboratory.

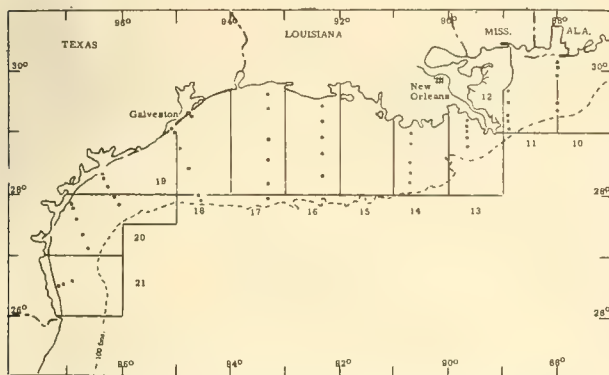
Postlarval brown shrimp were captured in the tidal passes throughout the winter. We therefore initiated our brown shrimp survey in the estuary proper during the last week in January, earlier than originally planned. Postlarvae were present in East and Lower Galveston Bays in late January but unfortunately adverse weather conditions prevented sampling in the upper bays until the second week of February. Postlarvae then occurred everywhere in the estuary except in Clear Lake and upper Trinity Bay. By late March, they were also being caught in these areas.

We had previously observed that postlarvae grew very little when water temperatures remained below about 20° C. (68° F.). Bay waters warmed to this level by mid-March and significant postlarval growth was evident by the end of the month. In contrast, postlarvae did not enter the estuary during 1964 until late February and marked growth was not observed until mid-April.

MOVEMENT OF POSTLARVAL SHRIMP FROM OFF-SHORE SPAWNING AREAS: The movement of postlarval shrimp into bays from offshore spawning areas is an accepted feature of the *Penaeus* life cycle. The distances involved coupled with the small size of the postlarvae has caused speculation as to whether this trip represents active or passive movements of the animals. Interest in this problem has led to laboratory measurements of postlarval swimming velocity. The time required for individual brown shrimp postlarvae to swim a known distance was used to estimate speed. Assuming uninterrupted movement and ignoring effects of water movement, we can extrapolate the data to 2.6 miles per day. Further study will be required to determine the capacity of postlarvae to sustain these rates, and to test for the possible influence of environmental factors on postlarval movement. At the moment, however, it is interesting to note that field observations by personnel of the Estuarine Program indicate an average velocity of 2 miles per day for the movement of brown shrimp postlarvae through Galveston Bay.

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-27 (March 12-25, 1965): Small white shrimp counting 41-50 to the pound were caught at inshore stations in the up to 10-fathom depth range of 4 statistical areas worked during this cruise by the chartered research vessel Gus III. The vessel, operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., covered 8 statistical stations on the cruise, another of a series in a continuing Gulf of Mexico shrimp distribution study.



Station pattern for shrimp distribution studies by M/V Gus III, Cruise GUS-27.

A total of 25 standard 3-hour tows with a 45-foot flat trawl was made. The vessel also made 55 plankton tows, and 42 bathythermograph (BT) and 167 water (Nansen bottle) casts. Bottom core samples were obtained at 16 eastern stations in depths ranging from $7\frac{1}{2}$ to 40 fathoms.

Catches of brown shrimp were generally spotty in all areas, with the largest catch of 21 pounds (26-30 count) from the 11-20 fathom depth of area 18. That area also yielded 6 pounds of 15-20 count brown shrimp from the over 21-fathom depth, and 16 pounds of small white shrimp (41-50 count) from the up to 10-fathom depth. Area 19 yielded 12 pounds of 31-40 count brown shrimp from the 11-20

fathom depth, in addition to small white shrimp (15 pounds of 41-50 count) caught in the up to 10-fathom depth.

A tow in the 11-20 fathom depth of area 13 yielded 12 pounds of white 15-20 count shrimp, and only 2 pounds of the same size were caught in area 16 from the up to 10-fathom depth.

Area 20 yielded some 25 pounds of white and brown shrimp ranging from 15-20 count down to 51-67 count. The largest catch from that area was 9 pounds of 26-30 count brown shrimp from the over 21-fathom depth.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, May 1965 p. 22.

**Industrial Fishery Products****U. S. PRODUCTION, 1964:**

The production of industrial fishery products in the United States, American Samoa, and Puerto Rico in 1964 by 160 plants was



Menhaden vessel docked at a fishery industrial products plant in Empire, La.

U.S. Industrial Fishery Products Production, 1964

Products	Number of Plants	Unit	Quantity	Value
Marine-animal scrap and meal	109	Tons	235,252	\$27,944,858
<u>Marine-animal oils:</u>				
Body oil	74	1,000 lbs.	180,175	13,272,991
Liver oil	2	"	23	24,000
Fish solubles	36	Tons	93,296	5,662,194
Marine pearl shell buttons	6	Gross	406,917	1,004,344
Mussel shell buttons	7	"	226,625	272,281
Oyster shell grit and lime ("Live and reef shells")	14	Tons	362,543	4,914,924
Miscellaneous industrial products	22	-	-	16,551,404
Total	1/ 160	-	-	69,646,996

1/Exclusive of duplication.

valued at \$69.6 million--an increase of \$1 million as compared with 1963.

The 1964 production of 235,252 tons of fish meal and scrap was 8 percent less than the 255,907 tons produced in 1963, while marine-animal oils (180 million pounds) was 3 percent less, and fish solubles (93,296 tons) declined 7 percent. Other industrial products (agar-agar, kelp extracts, liquid fertilizer, mussel-shell dust and chips, animal feeds, fertilizers, etc.) accounted for the increase in the total value of industrial products in 1964.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES PRODUCTION, MARCH 1965:

Preliminary data on U. S. production of fish meal, oil, and solubles for March 1965 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U.S. Production 1/ of Fish Meal, Oil, and Solubles, March 1965 (Preliminary) with Comparisons			
Area	Meal Short Tons	Oil 1,000 Pounds	Solubles Short Tons
March 1965:			
East & Gulf Coasts	837	200	40
West Coast 2/	1,921	342	1,048
Total	2,758	542	1,088
Jan.-Mar. 1965			
Total	7,157	1,664	2,337
Jan.-Mar. 1964			
Total	5,787	1,465	2,793
1/Does not include crab meal, shrimp meal, and liver oils.			
2/Includes American Samoa and Puerto Rico.			

As usual, complete details on United States production of industrial products will appear several weeks later in the monthly statistical publication "Fish Meal and Oil," issued from Washington, D. C.



Maine Sardines

YEAR-ROUND CANNING SEASON APPROVED:

A bill has been passed by the Maine Legislature and signed into law by the Governor to legalize the taking of herring for canning purposes from the coastal waters of Maine on a year-round basis. The new law becomes effective 90 days after the adjournment of the Maine legislature which means it should be in effect before 1966.

For many years the legal season in Maine for taking herring for canning has been from April 15 to December 1, but temporary exceptions were made on an emergency basis for 3 years during World War II, and in 1961-62 when there was a serious fish shortage.

Winter canning of Maine sardines has been costly, and the winter packs have been limited by cold weather, gales, and generally adverse conditions. Purse seining has been the only method by which the fish could be taken; and the canneries, by law, have not been able to take any fish containing feed.



When the 1964 Maine sardine season closed on December 1, an Eastport canner continued to pack using Canadian herring, contending that Maine limitations on winter sardine canning did not apply in the case of imported fish. The Washington County District Court upheld his contention (opening up winter canning in that county only). Four firms took advantage of the ruling. Their winter pack of Maine sardines totaled about 40,000 cases as of April 15, 1965. On the other hand, winter canning with imported fish was barred by a Maine court in Hancock County.

The new legislation will open winter sardine canning to all Maine plants and will allow winter canning with domestic as well as imported herring.

The regular 1965 Maine sardine canning season is expected to produce a normal pack of 1,500,000 to 1,600,000 cases. A total of 23 Maine sardine plants was expected to operate in 1965, and volume production was expected to begin in late May or June.

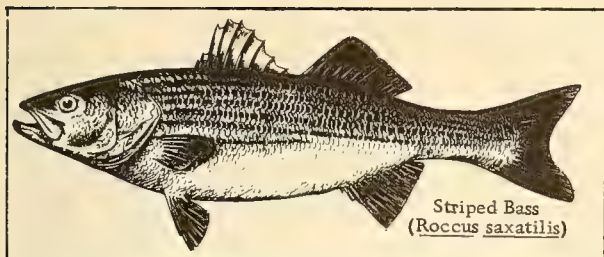
Note: See Commercial Fisheries Review, April 1965 p. 23.



Maryland

STRIPED BASS TAGGED IN SPAWNING AND MIGRATION STUDY:

In April 1965, nearly 2 tons of striped bass or rockfish were tagged and released in the Patuxent River by a team of scientists from the University of Maryland's Natural Resources Institute studying their spawning and migration habits. The Institute is also conducting a pollution study on the Patuxent Riv-



er, which is one of the most important striped bass spawning grounds.

A 64-pound female striped bass tagged in the Patuxent in 1964 was caught recently off Cape Hatteras, N. C., by a commercial fisherman. The tag was returned to the Maryland Institute's Chesapeake Biological Laboratory, which is conducting the study in cooperation with the U. S. Bureau of Commercial Fisheries.



North Atlantic

SOVIET FISHING ACTIVITY OFF COAST, APRIL 1965:

There was a continual increase in Soviet fishing activity in the North Atlantic during April 1965. These observations were made by the staff of the Fisheries Resource Management Office, U. S. Bureau of Commercial Fisheries, Gloucester, Mass., which has been conducting weekly reconnaissance flights cooperatively with the U. S. Coast Guard. A total of 107 vessels were sighted and identified as 53 factoryship stern trawlers, 44 refrigerated and nonrefrigerated side trawlers, 9 processing and refrigerated fish transports, and 1 fuel and water carrier. This compared with 84 vessels sighted in March 1965 and 64 vessels observed in April a year earlier. The increased number of Soviet vessels during April was attributed mainly to the arrival of SRT's and SRT-R's which had not been seen in numbers since they left Georges Bank in September 1964.

Fishing operations of the Soviet vessels generally ranged from south of Montauk Point, Long Island (Hudson Canyon), along the 100-fathom curve of the Continental Shelf to south and southeast of the Nantucket lightship (Veatch Canyon to Lydonia Canyon).

All of the Soviet vessels observed during April were actively engaged in fishing operations and had substantial quantities of fish on deck. Those vessels fishing south of Long Island and Nantucket Shoals were catching primarily red hake and smaller amounts of whiting. It was noted that the Soviet fleet extended its operations to include the southwest part of Georges Bank and appeared to be taking considerable amounts of both herring and whiting.

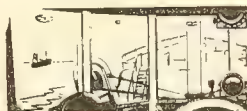


Soviet processing and refrigerated factoryship Matochkin Shar. Smaller vessels standing by are Soviet trawlers of the Pioneer class. Photo was taken in April 1965, about 60 miles south of Nantucket Island.

A reconnaissance flight was made along the Middle Atlantic coast area during the month where 3 Soviet factoryship stern trawlers were sighted and identified 90 miles east of Cape May, N. J. Each of those 3 vessels had substantial amounts of fish on deck but the species were not identified.

Soviet fishing activity along the Middle Atlantic coast as of April did not develop to the extent that it did in 1964. The species of fish in that area have apparently not been found in sufficient quantity to warrant any major deployment of vessels from the fishing grounds where good catches of red hake, whiting, and herring were being made.

Note: See Commercial Fisheries Review, May 1965 p. 24.



North Atlantic Fisheries Explorations and Gear Development

SURF CLAM SURVEY CONTINUED:

M/V "Delaware" Cruise 65-2 (February 19-March 18, 1965): This cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware off the coast of Maryland and Virginia was a continuation of an Atlantic surf clam survey conducted during the summers of 1963 and 1964. The survey was initiated in cooperation with the Sea Clam Packers Committee of the Oyster Institute of North America.



Fig. 1 - Sample of surf clams from one of the tows made aboard the M/V Delaware during Cruise 65-2. The sample shows the size range of the clams. The longest measured six inches in length, the smallest measured two inches.

Objective of Delaware Cruise 65-2 was to survey as much as possible of the remaining unsurveyed section of Surf Clam Area V. Clam explorations in that area had been previously conducted during June-July 1964 by the Bureau's research vessel Rorqual. During this 4-week cruise, commercially usable concentrations of surf clams were found at many of the sampling stations in Survey Area V.

SURVEY PROCEDURE: The same survey procedure was followed during this cruise as

during past surveys in this and other areas. Jet-dredge samples were taken at each survey station using a new 48-inch experimental dredge designed to retain all clams exceeding 1.5 inches long. Special features of the new dredge include a retainer compartment for sampling very small size clams, an odometer for measuring the distance traveled by the dredge, and a remote reading thermometer for taking bottom temperatures. A newly designed clam sounder was attached to the dredge but the unit became inoperable during the early part of the cruise and little information was obtained from its use. A water meter was installed in the main feed line to measure the amount of water flowing to the dredge jets from the pump. Readings obtained from the meter showed a maximum flow of 1800 gallons per minute was supplied to the dredge jets at pressures of 70 to 80 pounds per square inch during normal operation.

Survey operations were started on grid line number one (which formed the west boundary of the area) and proceeded from that line seaward and northward to the position where the 1964 survey was terminated. Clam dredge tows were at one-mile intervals along a "grid" of loran lines spaced 1 mile apart. Because of unfavorable bottom conditions, grid line No. 3 and the upper ends of some of the other grid lines were bypassed during the survey.

SURF CLAM CATCHES: Of the 400 stations surveyed during the cruise, 270 of them yielded surf clams varying in abundance from 1 clam to 5.7 bushels per 4-minute tow; 130 tows yielded no surf clams. A total of 34 stations yielded one or more bushels per tow. Many catches of slightly less than one bushel were also made, usually from areas adjacent to the locations of the better catches.

Generally, the inshore and offshore sections of the area surveyed produced the poorest catches of clams while the central section yielded the better catches. The composition of the bottom in much of the inshore area is largely of mud, clay, mud and clay together, or soft silt, with very little sand or gravel. As expected from the results of past surveys, the deeper offshore section produced few large catches. A large portion of the bottom of that section was found to be very hard and very unproductive. It was impossible to get the blade of the dredge to dig more than 2 to 3 inches into the hard bot-

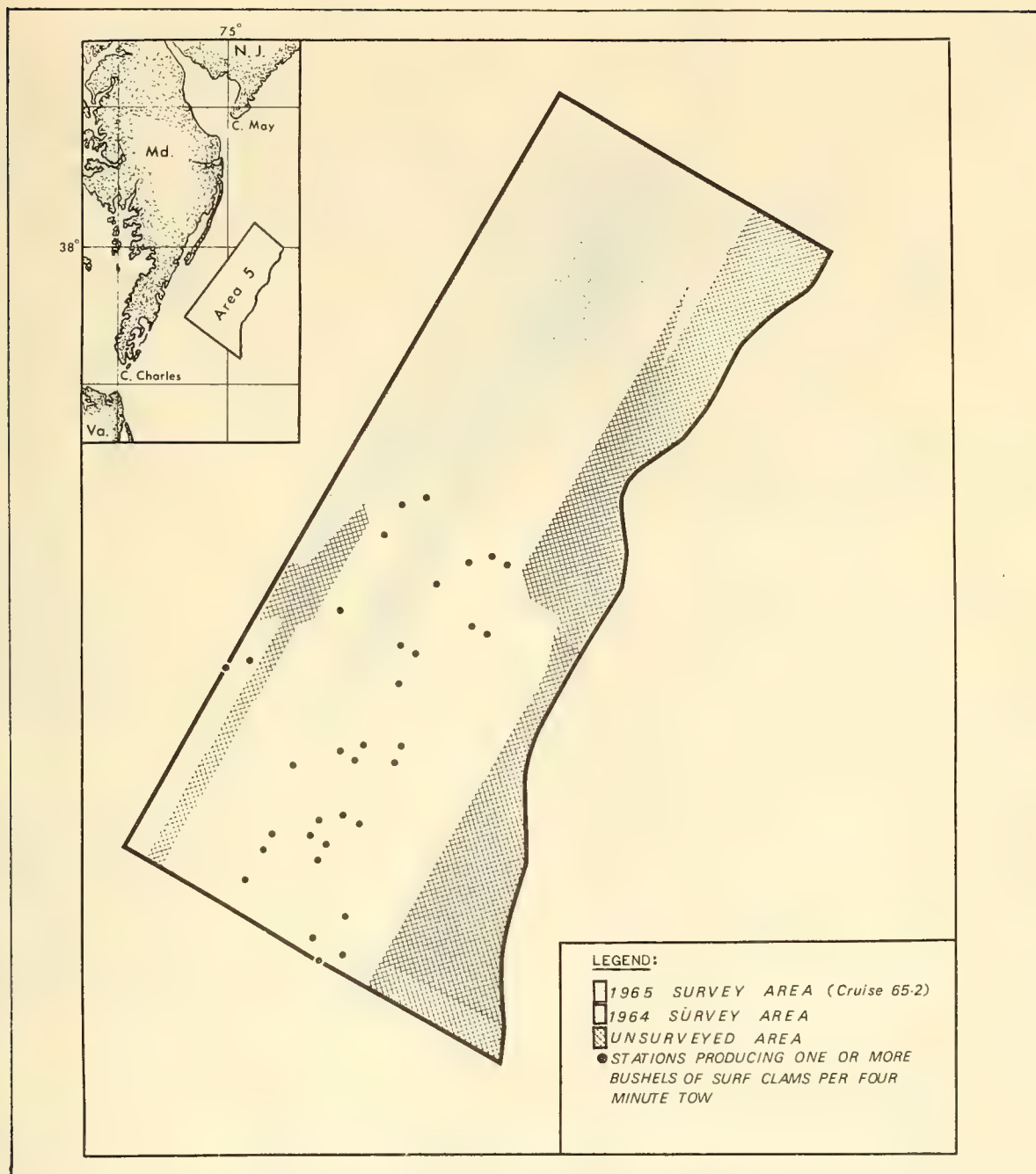


Fig. 2 -Shows survey status of Surf Clam Area 5 and producing stations during M/V Delaware cruise 65-2 (February 19-March 18, 1965).

tom of most of that deeper section. But a few good catches were made in depths of up to 24 fathoms where tows were made on gravel bottoms. It is possible that some surf clams may be found in still deeper offshore waters, if suitable bottom can be found there.

Of the 34 tows made which yielded 1 or more bushels per tow, the 3 best catches occurred where the depth of water was 17 fathoms (102 feet). The depth range for the 34 samples was from 14 to 22 fathoms. The maximum of that range represents the greatest depth where good populations of clams

were found up to the time of this cruise. Most of those catches were made where the bottom was composed of gravel, gravel and sand mixed, or a very coarse sand.

SIZE OF SURF CLAMS: During this survey, as well as on previous surveys conducted by the U. S. Bureau of Commercial Fisheries, all size groups except the very smallest were taken in most of the tows. Also in agreement with previous findings, the predominant size group taken in most of the catches were those 5 inches or more in length (within the commercial size-range). Many clams in the medium-size group (3-5 inches) were taken; the bulk of the catch at some of the stations were of that size clam. The medium sizes were found to be more abundant in this part of Area V than in the northwest section covered during the 1964 summer survey. Fewer of the 1.5-inch or smaller clams were taken during this cruise; this was expected since the gear was not designed to retain the very small clams.

Surf-clam shells were taken at most of the stations surveyed with the numbers collected per station varying from 1 or 2 shells up to 12 bushels. Considerable quantities of shells were present in many of the tows that accounted for some of the best clam catches in the area. This is considered normal in a clam-producing area because shell accumulation will occur through natural mortality.

BLACK QUAHOGS: Very few black quahogs were taken in the areas where the best catches of clams were made. They were also absent from 108 of the 130 tows from which no surf clams were taken. The best catches of black quahogs were made in the area at north end of the offshore grid lines in water depths of 22 to 24 fathoms; the numbers taken per tow varied from 1 to 567. Smaller quantities of black quahogs were taken in the catches from the southern end of those same grid lines and at depths of 20 to 24 fathoms. Considerable numbers of quahog shells were also taken in some of the tows made in those areas.

CONTINUATION OF SURVEY: Another clam survey cruise of the vessel Delaware was scheduled for May-June 1965. A third cruise is planned for October 12 to November 10, 1965.

Note: See Commercial Fisheries Review, November 1964 p. 41.



Oceanography

UNIVERSITY OF RHODE ISLAND EXPANDS OCEANOGRAPHIC CENTER:

Construction of two new oceanographic buildings, costing \$1.2 million and providing nearly an acre of additional laboratory, office, library, and other space, was scheduled to begin in June 1965 on the University of Rhode Island's Narragansett Bay Campus.

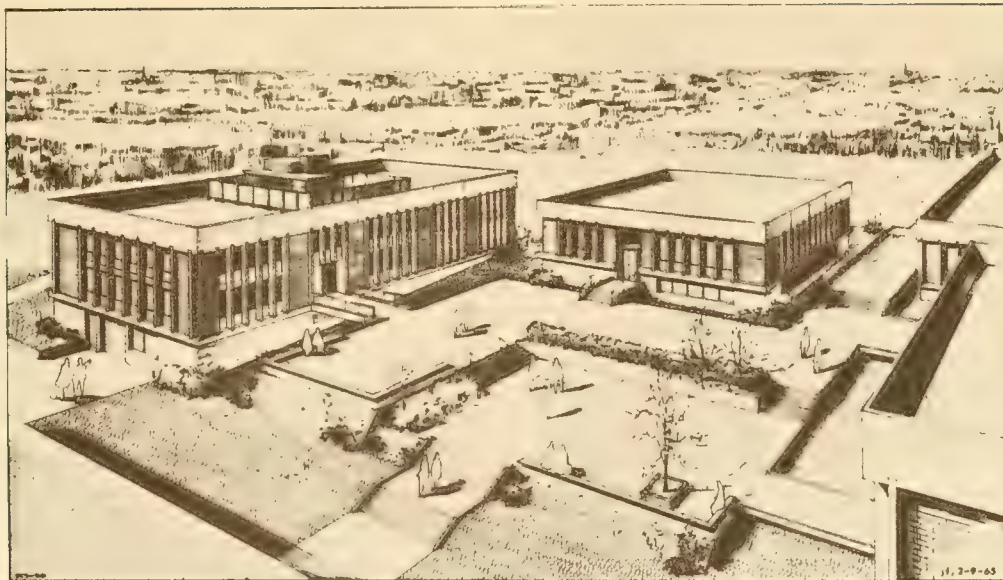
"This expansion of our oceanographic facilities comes at a most opportune time, because the Federal Government and private business firms are showing a greater interest in developing our ocean resources," said the president of the University of Rhode Island. "This region, I believe, is in a unique position to capitalize on this growth," he added.

The new construction includes a \$950,000 laboratory-office building, financed primarily with a grant from the National Science Foundation, and a separate library-data processing center, which will be built with \$250,000 from a State bond issue. The latter facility has been planned so that it can be expanded if the University receives additional outside funds.

The new buildings will nearly triple the laboratory space now provided at the 88-acre Narragansett Bay Campus by existing facilities in the C. J. Fish Laboratory and the North Laboratory.

The new library will also serve existing Federal and State facilities on the campus, plus a proposed \$500,000 Marine Game Fish Research Laboratory and a \$1,750,000 National Water Quality Standards Laboratory, which the Federal Government may build in the area.

"Within four years we expect to have at least 400 persons working in the marine sciences at the Narragansett Bay Campus and using the library," said the dean of the Graduate School of Oceanography. The present student body of 49 graduate students--27 of whom are working for Ph. D.'s--would be increased to more than 100. The growth of oceanographic research in recent years is well known, but most people are not aware of the lack of well trained personnel in this field," the dean explained. "However, this lack is generally agreed to be the limiting factor in our national program of expanded oceanographic research. Since the University of Rhode Island is one of only six universities that trains scientists in all aspects of oceanography, I believe our expansion will contribute to help overcome this shortage," he added.



Architect's drawing of two new buildings to be constructed on the University of Rhode Island's Narragansett Bay Campus. On the left is the \$950,000 laboratory-office building and in the center is the \$250,000 library-data processing center.

The new laboratory building will contain 29 offices and 22 air-conditioned laboratories, distributed over the first and second floors. The basement will include a dressing room for SCUBA divers. Part of the roof will be decked over with wood for out-of-door experimental apparatus. In all, the building will contain over 30,000 square feet.

The 2-story library will include a large lecture hall, conference-seminar rooms, offices, a photographic laboratory, work areas, a computer facility, and drafting and data processing areas. The collection of scientific literature, journals, and books will be a specialized one, devoted to the marine sciences. (University of Rhode Island, April 15, 1965.)

Note: See Commercial Fisheries Review, July 1964 p. 25.



Oregon

SPRING CHINOOK SALMON PLANTINGS INCREASE IN THE WILLAMETTE RIVER:

The Oregon Fish Commission's new multiple-use policy for its Dexter holding ponds yielded an additional 750,000 yearling chinook salmon for planting in the Middle Willamette River in the spring of 1965 (in addition to usual hatchery plantings of 3 million spring

chinook in the Middle Willamette). When planted the yearling salmon from Dexter weighed 12 to the pound and measured between 6 and 7 inches in length.

The Dexter facility was originally designed to collect and hold adult spring chinook blocked from upstream passage by Dexter Dam. Spring chinook which arrive in April and May, well before the fall spawning period, move up the fishway immediately below Dexter Dam and are trapped in the holding ponds where they are retained until their eggs mature in September or early October. When they are ripe the fish are spawned by hatcherymen and the fertilized eggs transported to the Willamette Hatchery for incubation and rearing of the fry.

During both 1963 and 1964, spring chinook egg takes at facilities in the Willamette system have exceeded the rearing capacity of the hatcheries there. In an effort to make the best possible use of surplus fry, one of the two adult holding ponds at Dexter was converted to a rearing pond. (Under present operations, only one of the ponds is needed to hold adult fish through the summer.) Use of the pond, which measures 40 by 200 feet, raised Oregon hatchery production of yearling spring chinook on the Middle Willamette by 25 percent from 3 million to 3.75 million during the past season at a relatively low additional cost.

Plans call for one of the Dexter ponds to be used to rear spring chinook yearlings again in 1965. (Oregon Fish Commission, April 15, 1965.)



Salmon

U. S. PACIFIC COAST

CANNED STOCKS, APRIL 1, 1965:

On April 1, 1965, canners' stocks in the United States of Pacific canned salmon totaled 1,435,745 standard cases (48 1-lb. cans), 530,442 cases less than on March 1, 1965, when stocks were 511,774 cases less than on February 1, 1965.

On the basis of a total of 1,726,858 actual cases (consisting of cans of $\frac{1}{4}$ -lb., $\frac{1}{2}$ -lb., 1-lb., etc.), pink salmon accounted for 49.2 percent (849,663 cases of which 676,562 cases were 1-lb. talls) of the total canners' stocks on April 1, 1965. Next came chum (428,803 cases, mostly 1-lb. talls), followed by red (299,277 cases). The remainder of about 8.6 percent was coho (silver) and king salmon. Nearly 80 percent of the pink salmon stocks on hand was packed in 48 1-lb. cans, and the balance mostly in 48 $\frac{1}{2}$ -lb. cans.

Total Canners' Stocks of Pacific Canned Salmon, April 1, 1965			
Species	Apr. 1, 1965	Mar. 1, 1965	Feb. 1, 1965
..... (No. of Actual Cases)			
King . .	46,882	63,915	79,834
Red . .	299,277	411,505	511,299
Coho . .	102,233	128,589	146,885
Pink . .	849,663	1,201,716	1,550,541
Chum . .	428,803	536,529	648,041
Total	1,726,858	2,342,254	2,936,600

From March 1 to April 1, 1965, pink salmon stocks were lower by 352,053 actual cases (1-lb. talls lower by 300,953 cases), reds were down 112,228 cases, and chums were down 107,726 cases.

Carryover stocks at the canners' level totaled 1,175,588 standard cases on July 1, 1964, the approximate opening date of the Pacific salmon packing season. Adding the new season pack of 3,922,356 standard cases brought the total available supply for the 1964/65 season to 5,097,944 standard cases.

Shipments at the canners' level from July 1, 1964, to April 1, 1965, totaled 4,623,018 actual cases (equal to 3,662,199 standard cases).

Data on canned salmon stocks are based on reports from U. S. Pacific Coast canners who packed over 98 percent of the 1964 salmon pack. (Division of Statistics and Economics, National Canners Association, April 24, 1965.)



Shrimp

UNITED STATES SUPPLY AND DISPOSITION, 1962-1964:

The available United States shrimp supply in 1964 was 5.6 percent lower than in 1963 but 10.2 percent higher than in 1962. United States shrimp imports again were at a record high in 1964 having increased 1.1 percent from the previous year and 10.9 percent from 1962.

U. S. Supply and Disposition of Shrimp, 1962-1964			
Item	1/1964	2/1963	1962
. . . (1,000 Lbs., Shell-on). . .			
Supply--Heads-on weight:			
Domestic landings	208,400	240,478	191,105
Foreign product of U.S. fisheries 3/	954	253	479
Imports 4/	269,113	266,205	242,580
Total supply (heads-on)	478,467	506,936	434,164
Disposition--Heads-on weight (approximate):			
Frozen:			
Headless	6/	283,271	253,935
Meat, raw (includes some cooked) 5/	6/	109,703	81,959
Meat, cooked 5/	5/	15,232	15,202
Breaded	91,208	76,700	77,698
Specialties	6/	1,020	1,101
Total frozen 7/	389,632	398,978	342,240
Canned	43,057	68,272	56,522
Sun-dried	4,568	5,640	3,296
Fresh	25,000	27,000	25,000
Unclassified	16,210	7,046	7,106

1/Preliminary.

2/Revised.

3/Caught by domestic craft, principally in waters off Central America, and shipped to the United States. Reported by the U.S. Bureau of the Census as "Products of the Americas Fisheries."

4/The composition of imported shrimp includes estimates for 1962 and 1963. Imports by commodities listed below were converted to heads-on weight by multiplying the quantity of headless shrimp by 1.59, raw meat by 2.04, cooked meat by 3.13, breaded by 1.00, canned by 3.21, dried by 7.69, and unclassified by 1.59.

Item	1964	1963	1962
. (1,000 Lbs.)			
Shrimp:			
Headless	112,149	111,717	108,628
Meat, raw	27,385	29,460	22,703
Meat, cooked . . .	2,585	2,547	1,995
Breaded	508	484	421
Canned	3,004	4,120	2,911
Dried	404	279	56
Unclassified . . .	8,542	2,923	4,469
Total	154,577	151,530	141,183

5/May include some fresh products.

6/Not available.

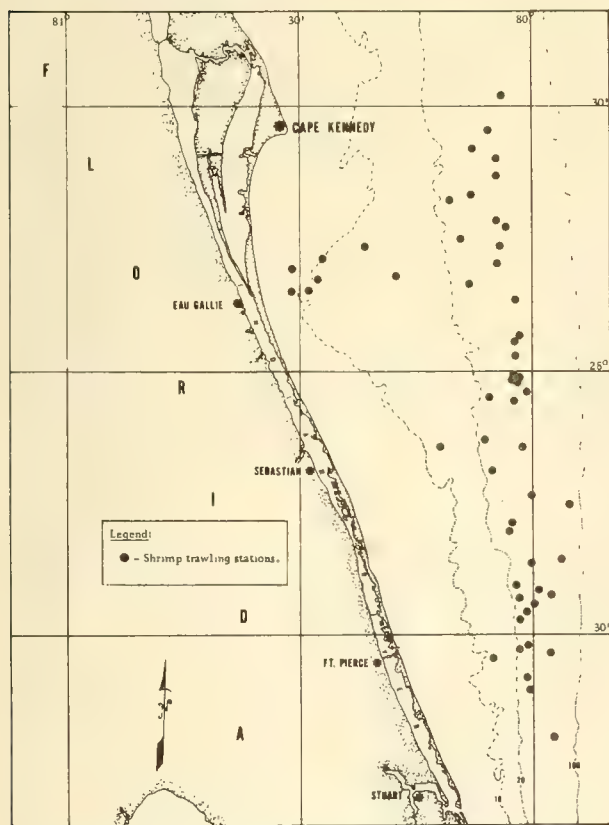
7/The totals do not add and are less than actual totals because products frozen more than once were eliminated.

Note: To convert the weight of heads-on shrimp to heads-off, divide by 1.59 which will give approximate weight of heads-off shrimp.

South Atlantic Fisheries Explorations and Gear Development

STOCKS OF BROWN SHRIMP OFF FLORIDA'S EAST COAST STUDIED:

M/V "Oregon" Cruise 99 (March 8-17, 1965): To obtain more information on the location and catch rates of offshore brown shrimp (*Penaeus aztecus*) stocks off Florida's east coast between Cape Kennedy and Stuart was the objective of this cruise by the exploratory fishing vessel Oregon of the U. S. Bureau of Commercial Fisheries. Brown shrimp were discovered in that area during a January 1965 cruise of the Oregon.



Area investigated off Florida's east coast during M/V Oregon cruise 99 (March 8-17, 1965).

During this cruise, a total of 61 trawling stations was made in depths of 10 to 70 fathoms using standard 40-foot and 70-foot flat shrimp trawls. The work done on the cruise revealed a wide scattering of the brown shrimp stocks with all catch rates below commercial levels. This was in sharp contrast to the well-defined concentration of shrimp in a depth of 30 to 32 fathoms found in January

1965. The highest catch rate with the 65-foot trawl was 25 pounds of 16-20 count (heads-on) brown shrimp per hour.

Bottom temperature patterns during the cruise were very confused. It appeared that the two weeks of strong winds immediately preceding the cruise severely affected environmental conditions in the fishing area. Bottom temperatures were obtained with a reversing thermometer at 41 locations between 10 and 40 fathoms. These showed a 6° to 10° F. variation at all depths between 22 and 38 fathoms and an apparent break-up of typical depth/temperature stratifications.

Trawlable bottom was found over most of the 10- to 38-fathom range, with scattered patches of broken bottom causing a few tear-ups. A 2-fathom ridge was encountered along the 39-40 fathom depth level.

Small numbers of pink shrimp (*P. duorarum*) were scattered in catches between 10 and 23 fathoms. Scattered white shrimp (*P. setiferus*) were found in 10 to 12 fathoms.

Note: See Commercial Fisheries Review, April 1965 p. 36.



Sport Fishing

LICENSE SALES INCREASED IN 1964:

A total of 20,219,457 sport fishermen in the United States bought sport fishing licenses in fiscal year 1964 (July-June) as compared with 19,831,644 in fiscal year 1963, the U.S. Interior Department announced on April 21, 1965.

The number of licensed sport fishermen in 1964 was 387,813 more than in the previous fiscal year, and total license expenditures increased by \$2,433,168 to a new high of \$60,213,427.

State game and fish departments in the 50 States certify the number of their paid hunting and sport-fishing license holders to Interior's Bureau of Sport Fisheries and Wildlife for use as a basis for distributing Federal aid funds for state fish and wildlife restoration projects.

The number of paid license holders is not an accurate measure of the total hunting and fishing public, the Department of the Interior pointed out. In most States, persons younger



Fisherman in large spring near Page Dam, Malheur Refuge, Oregon; casting fishing rod and creel shown.

or older than certain age limits are allowed to hunt or fish without licenses. Also, some States allow landowners to hunt or fish on their own property without a permit and only 6 States require a license to fish in salt water.

Some States require sportsmen to purchase separate licenses, stamps, permits, or tags to fish for different kinds of fish. For example, a special stamp is required in some States to fish for trout.



U. S. Foreign Trade

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-April 3, 1965, amounted to 5,631,316 pounds (about 268,158 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs. That was considerably less than the 7,222,255 pounds (about 343,917 standard cases) imported during January 1-March 28, 1964.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1965 at the 12½-percent rate of duty has not been announced; however, in 1964 the quota was 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that

quota would have been dutiable at 25 percent ad valorem.

TRENDS IN UNITED STATES IMPORTS OF FISHERY PRODUCTS, 1963:

The value of annual imports of fishery products entering the United States reached a new high in 1963. In that year, United States fishery imports from more than 100 countries rose to a total value (at foreign port of shipment) of \$490,708,000. This was an increase of 1 percent or \$6 million more than the 1962 imports, and an increase of 44 percent or \$93 million over the value of the 1961 fishery products imports. Imports of edible fishery products in 1963 were valued at \$394,546,000; inedible fishery products \$96,162,000. The value of imported fishery products continued to greatly exceed United States exports of similar products.



Table 1 - Value of U.S. Imports of Fishery Products (Edible and Inedible) by Selected Countries of Origin, 1959-63^{1/}

Country	1963	1962	1961	1960	1959
(US\$1,000)					
Canada	118,040	116,336	108,035	102,877	101,967
Japan 2/ . . .	95,357	107,773	88,263	85,256	96,226
Mexico	59,906	53,529	45,766	36,705	32,869
Peru	35,038	24,818	16,729	14,270	16,374
So. Africa					
Republic . . .	17,270	19,688	14,468	12,030	12,090
Norway	16,778	18,950	15,101	12,506	16,405
Australia . . .	12,520	14,884	10,856	9,839	8,180
Iceland	15,006	11,607	11,528	9,306	10,000
Panama	7,076	7,884	6,707	5,767	6,458
Brazil	6,198	6,827	5,074	3,916	3,002
Denmark	5,412	7,069	5,246	4,342	8,239
Ecuador	5,788	6,443	4,619	4,467	4,159
Portugal	5,533	5,984	6,525	5,289	5,452
India	8,353	5,664	2,777	2,363	2,239
El Salvador . .	4,303	5,100	5,510	4,215	1,297
West Germany .	4,178	5,278	4,160	4,100	1,814
Netherlands . .	3,460	3,667	1,736	2,562	2,628
France	2,724	2,750	2,087	2,317	2,230
United Kingdom	4,578	3,415	2,309	1,759	2,388
Chile	6,046	4,208	2,089	2,630	1,282
Angola	623	554	500	267	3,023
Cuba	-	98	1,793	3,901	4,810
Other	56,521	52,331	35,180	29,381	23,368
Total	490,708	484,857	397,058	360,065	366,500

^{1/}Value at the foreign port of shipment.

^{2/}Does not include fresh or frozen fish, mostly tuna, transhipped through other countries.

Trend by Countries: Canada, Japan, and Mexico continued to be leading suppliers of fishery products to the United States (table 1). Those 3 countries accounted for 55 percent of the total value of fishery products imports. Canada supplied 24 percent of the total, Japan 19 percent, and Mexico 12 percent. Peru, South Africa Republic, Norway, Iceland, and Australia were the next leading suppliers with imports ranging from \$12 to \$35 million.

CANADA: Canada, with fishery products valued at \$118 million continued to be the principal supplier of fishery products to the United States. Imports from that country in 1963 increased about 1 percent over the preceding year. Leading commodities were as follows:

	1963	1962
	... (US\$1,000) ...	
Fresh or Frozen:		
Lobster	16,259	15,000
Fresh-water fish	10,881	11,737
Fish blocks	15,373	15,162
Groundfish fillets	12,481	12,526
Salmon	4,810	5,298
Halibut	6,216	7,791
Flounder fillets	4,594	5,422
Fresh-water fillets	6,441	5,693
Scallops	6,168	4,810
Other fresh or frozen	6,487	5,295
Canned lobster	4,332	5,507
Fish meal and scrap	6,489	5,193
Cod, haddock, etc.,	6,815	6,698
pickled or salted		
Other fishery products	10,694	10,204
Total	118,040	116,336

JAPAN: The value of fishery imports from Japan was \$95,357,000 a decrease of 13 percent from 1962. Japan ranked second among United States suppliers of fishery products. Tuna and pearls still remained the leading commodities. United States imports of fishery products from Japan were:

	1963	1962
	... (US\$1,000) ...	
Fresh or frozen:		
Albacore	9,091	9,759
Albacore loins and discs	861	669
Other tuna	16,020	16,025
Other loins and discs	2,367	3,118
Shrimp	2,443	2,740
Swordfish	4,616	6,232
Fresh-water trout	977	747
Frog legs	1,143	1,362
Oysters	829	213
Halibut and salmon (mainly halibut)	924	1,944
Fish filleted, boned	737	1,161
Canned:		
Light meat tuna in brine	13,712	12,053
White meat tuna in brine	7,383	7,912
Salmon	406	2,238
Crab meat	6,331	4,635
Clams	810	809
Oysters	2,645	2,410
Pearls, cultivated	17,277	17,934
Whale and sperm oil	1,819	3,563
Other	4,966	12,249
Total	95,357	107,773

MEXICO: Mexico ranked third as a supplier of fishery products to the United States. Although the quantity of shrimp received from that country was lower than in 1962, the value of fishery imports from Mexico continued to increase and in 1963 was up 10 percent from the previous year. The value of fishery imports from Mexico was:

	1963	1962
	... (US\$1,000) ...	
Shrimp	51,656	46,700
Abalone	3,440	2,512
Lobster	1,012	1,077
Other	3,798	3,240
Total	59,906	53,529

PERU: The marked increase in the value of imports from Peru in 1963 was due to increased shipments of fish meal and scrap which amounted to over \$26 million--up 52 percent from the previous year. Imports from Peru of principal fishery products and byproducts were:

	1963	1962
	... (US\$1,000) ...	
Fish meal and scrap (fertilizer)	884	685
Fish meal and scrap (animal feed)	25,459	16,143
Bonito and yellowtail (canned)	1,531	2,247
Tuna, skipjack, fresh or frozen	2,856	2,219
Tuna, yellowfin, fresh or frozen	1,577	1,721
Other	2,731	1,803
Total	35,038	24,818

ICELAND: Fishery products represent 90 percent of Iceland's total exports. Imports from Iceland to the United States in 1963 amounted to \$15,006,000 in 1963--up 29 percent from a year earlier. Fish fillets and blocks accounted for nearly all of the imports from that country.

	1963	1962
	... (US\$1,000) ...	
Fillets, fresh or frozen	5,009	4,613
Fish blocks and slabs	7,010	5,547
Other	2,987	1,447
Total	15,006	11,607

AUSTRALIA: Australia is rapidly becoming one of the world's leading exporters of high-valued fishery products. The value of United States fishery imports from Australia was \$12,520,000 in 1963 and consisted of mostly frozen spiny lobster tails valued at \$11,619,000. United States imports from Australia have increased steadily since 1958 but dropped 16 percent in 1963 as compared with the previous year. The value of fishery imports from Australia was:

	1963	1962
	... (US\$1,000) ...	
Spiny lobster tails	11,619	13,867
Other	901	1,017
Total	12,520	14,884

OTHER COUNTRIES: Other leading suppliers of fishery products to the United States market are listed below showing the principal product shipped and the value of United States imports of that product:

	US\$1,000
South Africa Republic - Spiny lobster tails	12,754
Panama - Shrimp	6,975
India - Shrimp	6,000
Norway - Canned Sardines (in oil)	5,858
British Guiana - Shrimp	4,668
El Salvador - Shrimp	4,254
Brazil - Spiny lobster tails	3,823
Ecuador - Shrimp	4,374

Area of Origin: During 1963, North American countries continued to be the principal source of supply for

Table 2 - Value of United States Imports of Fishery Products by Area of Origin, 1963 1/			
Area	Edible	Inedible	Total
North America	191,014	9,184	200,198
Asia	86,450	30,400	116,850
South America	30,005	38,119	68,124
Europe	50,060	15,581	65,641
Oceania	16,653	328	16,981
Africa	20,364	2,550	22,914
Total	394,546	96,162	490,708

1/ Value at the foreign port of shipment.

Table 3 - Value of United States Imports of Fishery Products by Selected Commodities, 1959-63 1/

Commodity	1963	1962	1961	1960	1959
	(US\$1,000)				
Edible Products:					
Fresh or frozen:					
Shrimp	101,911	91,898	68,538	56,380	52,306
Tuna	34,962	45,715	30,228	31,713	29,728
Groundfish fillets and blocks	50,328	46,937	42,595	33,265	38,759
Lobster	54,473	57,182	49,039	44,794	38,635
Other	68,300	71,822	63,547	61,845	60,940
Total fresh or frozen . .	309,974	313,554	253,947	227,997	220,368
Canned:					
Tuna	23,864	22,884	22,175	19,142	21,688
Salmon	605	3,435	3,545	7,541	11,130
Sardines	12,994	16,291	12,543	9,115	8,370
Crab meat	6,370	4,701	5,780	5,514	7,947
Lobster	4,818	5,811	4,779	5,239	6,441
Other	19,444	18,878	17,530	16,087	17,083
Total canned	68,095	72,000	66,352	62,618	72,659
Other edible products . . .	16,477	15,328	15,438	16,765	18,006
Total edible products . . .	394,546	400,882	335,757	307,380	311,033
Inedible products:					
Fish meal	37,039	24,298	16,740	11,068	15,884
Pearls	17,906	18,935	16,925	14,563	13,678
Other	41,217	40,742	27,636	27,054	25,905
Total inedible products . .	96,162	83,975	61,301	52,685	55,467
Total fishery imports . . .	490,708	484,857	397,058	360,065	366,500

1/Value at the foreign port of shipment.

fishery products imported into the United States. Imports from Asia and South America ranked in second and third place.

Foreign trade plays a significant role in the economics of the United States fishing industry. In 1963, imports accounted for 56 percent of the total United States supply of fish and fish products. In a review of world import trade, data compiled for 1961 by the Food and Agriculture Organization (FAO) confirmed that the United States ranked as the world's leading importer of fishery products. According to FAO data, the United States bought more than twice as much fishery products as any other country. The United Kingdom ranked second and West Germany ranked third as importers of fishery products. United States imports of fishery products also surpassed fishery imports by the European Common Market when the imports of its member countries were considered as a unit.

Note: See Commercial Fisheries Review, February 1964 p. 56.



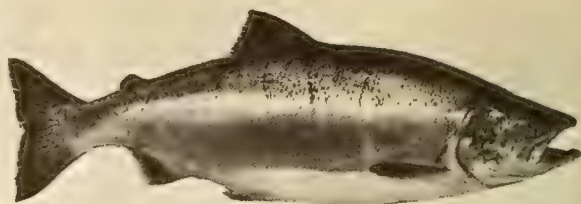
Washington

SALMON OUTLOOK IN PUGET SOUND ANNOUNCED AS NET FISHING REGULATIONS ARE SET FOR 1965:

The 1965 salmon runs to Puget Sound in Washington should include a good pink salmon run (but not as good as in 1963), a better than average run of king (chinook) salmon, a good run of silver (coho), and a better sockeye run than in 1963. But a poor run of chum salmon is expected. Those predictions were announced during public hearings in March 1965 when state regulations were adopted for the 1965 net fisheries for salmon in Puget Sound.

The 1965 Puget Sound net regulations are designed to generally allow open seasons of 4 to 5 days a week for king salmon, 2 days a

week for sockeye, 3 days a week for pink, 4 days a week for silver, and 2 to 4 days a week for chum salmon.



Pink or humpback salmon (*Oncorhynchus gorbuscha*).

Commercial net fishing for salmon in most areas of Puget Sound will begin either June 12 or June 28 and run until November 30, 1965. (An early season during part of May will be allowed in a few areas.) Weekly closed periods will vary from area to area. There are 11 salmon fishing areas in Puget Sound and the Strait of Juan de Fuca. (Washington State Department of Fisheries, March 29, 1965.)

SALMON FARM OPERATED IN COOPERATION WITH SPORT FISHING CLUB:

Grays Harbor on the Washington coast is the site of a cooperative salmon-rearing effort by the Washington Department of Fisheries and a local sport fishing club. The project began in 1964 when 50,160 king (chinook) salmon fry were planted in the Campbell Slough of Grays Harbor. The fish, which had been previously reared at the Simpson Hatchery, averaged 284 a pound and about 2 inches in length when planted. By June 16, 1964, the Campbell Slough salmon fry taken in test seines averaged 71 to the pound. That indicated good growth, and survival appeared quite high. In late June 1964, stop-logs were removed from the outlet structure and the young salmon were allowed to migrate into Grays Harbor and begin their ocean journey.

Adult fish will be returning from that plant in 1966 and 1967 to contribute to the various sport and commercial fisheries in Grays Harbor and the Pacific Ocean.

The Campbell Slough salmon farm is operated by the Washington State Fisheries Department in cooperation with the Grays Harbor Poggie Club and certain property owners. The Poggie Club purchased neces-

sary materials for the Slough's outlet structure, which was installed by the Fisheries Department.

The slough was treated with chemicals January 27, 1965, to rid it of scrapfish that would compete for food with the young chinook and also gobble up the small, growing salmon. Another salmon plant of 75,000 king salmon fry was introduced into Campbell Slough on March 16, 1965. (Washington State Department of Fisheries, April 8, 1965.)



Wholesale Prices

EDIBLE FISH AND SHELLFISH, APRIL 1965:

Prices in April 1965 were up 0.5 percent from the lower seasonal level of the previous month. A further decline from March to April in prices for several fresh fish items was offset by higher prices for a number of the major frozen fishery products (mostly because of declining cold-storage stocks) and

sharply higher prices for fresh-water fish during the Jewish Holidays. As compared with April 1964, the overall index this April was up 5.5 percent because of substantially higher prices for frozen halibut, Great Lakes fish, and moderately higher prices for ex-vessel haddock.

In the subgroup for drawn, dressed, or whole finfish, ex-vessel prices at Boston for large haddock this April dropped 20.5 percent from the previous month because of the seasonal increase in landings. But prices for other items in the subgroup were higher than in March. At New York City, prices for western frozen halibut were up 2.1 percent due to lower warehouse stocks. During the Jewish Holidays in April, prices were up sharply at New York City for Great Lakes round yellow pike (up 17.6 percent) and at Chicago for fresh Lake Superior whitefish (up 36.0 percent). From March to April 1965 the subgroup index was up 0.2 percent but was 12.8 percent higher than in April 1964 because of substantially higher prices this April for frozen halibut and Great Lakes fish.

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, April 1965 with Comparisons								
Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1957-59=100)			
			April 1965	Mar. 1965	April 1965	Mar. 1965	Feb. 1965	April 1964
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.8	108.3	109.7	103.1
Fresh & Frozen Fishery Products:					113.3	112.5	114.5	103.7
Drawn, Dressed, or Whole Finfish:					111.0	110.8	115.1	98.4
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.11	69.5	87.4	99.2	67.4
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.41	.40	119.8	117.3	117.3	82.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.83	.83	115.3	115.3	118.8	116.3
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.85	.63	126.9	93.3	96.3	84.3
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	1.00	.85	163.7	139.2	131.0	69.6
Processed, Fresh (Fish & Shellfish):					114.5	112.3	115.1	115.0
Fillets, haddock, smd., skins on, 20-lb. tins	Boston	lb.	.35	.40	85.0	97.1	105.6	75.3
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	1.00	.95	117.2	111.3	113.7	111.3
Oysters, shucked, standards	Norfolk	gal.	6.88	6.88	115.9	115.9	118.0	126.5
Processed, Frozen (Fish & Shellfish):					109.5	109.3	108.6	94.7
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.37	.38	93.8	95.0	88.7	93.8
Haddock, smd., skins on, 1-lb. pkg.	Boston	lb.	.37	.39	108.5	112.9	114.3	107.0
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.30	.31	105.2	108.7	108.7	108.7
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.94	.92	111.5	108.5	107.9	86.6
Canned Fishery Products:					101.2	101.3	101.8	102.5
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	20.25	20.50	88.3	89.3	91.5	95.9
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.44	11.44	101.6	101.6	102.6	103.3
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.13	7.13	120.9	120.9	105.9	103.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	10.25	10.00	131.5	128.3	128.3	116.5

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



The newer of two wholesale market buildings in the New York City Fulton Fish Market as it looked in 1940. There are plans to relocate the market.

Higher prices for fresh South Atlantic shrimp at New York City (up 5.3 percent) in April 1965 offset a fairly substantial price drop at Boston for fresh small haddock fillets (down 12.5 percent). As a result, the subgroup price index for processed fresh fish and shellfish rose 2.0 percent from March to April but was 0.4 percent lower than in April 1964 because of lower prices at Norfolk for shucked standard oysters.

The April 1965 subgroup index for processed frozen fish and shellfish rose only slightly from the previous month (up 0.2 percent). Prices were lower than in March for all items in the subgroup except frozen shrimp which rose 2.8 percent from March to April. As compared with April 1964, the index this April was 15.6 percent higher mainly because of a much stronger shrimp market and slightly higher prices for frozen haddock fillets (up 1.4 percent).

Market conditions for canned fishery products were mostly steady during April 1965. Prices for canned pink salmon were down only slightly from the previous month and movement of stocks continued at a good pace. Very low stocks of canned Maine sardines before the start of the new packing season were responsible for a 2.5-percent price increase from March to April and prices were 12.9 percent higher than in April 1964. As compared with the same month a year earlier, the canned fishery products subgroup index this April was down 1.3 percent as a result of lower prices for canned tuna and canned pink salmon.



SHARK REPELLENTS TESTED

A number of experiments to test the effect of repellents on sharks have been carried out by the U. S. Bureau of Commercial Fisheries Tuna Resources Laboratory, La Jolla, Calif., as a part of its tuna behavior program. Sharks associated with tuna are responsible for serious economic losses to commercial fishermen both because of damage to the nets and to the fish within the nets. During the experiments, sharks were attracted to the vessel by chumming, and repellents were then tested on the feeding sharks.

Repellents tested included commercial "Shark Chaser," nigroscein dye, fluorescein dye, and copper sulfate. In addition, the repelling effect of sound was tested with a "white noise" emitter designed by a United States East Coast firm. None of the repellents was found to be effective. Copper sulfate may have slowed the feeding frequency somewhat but did not stop it. The use of the mini-sub--a two-man, free-flooding submersible--and a special aluminum shark cage developed by a Bureau scientist made possible the documentation of the tests with some remarkable underwater motion pictures.



International

AFRICA

FRENCH-SPEAKING NATIONS DISCUSS ADMINISTRATION AND PLANNING FOR AFRICAN FISHERIES DEVELOPMENT:

A seminar on Administration and Planning for Fisheries Development, to which French-speaking countries of Africa were invited, was held at Abidjan, Ivory Coast, March 8-27, 1965. The seminar was sponsored by the Food and Agriculture Organization (FAO) and the chairman was the Chief of the Marine Fisheries section of the Ivory Coast Fisheries Service. In addition to Ivory Coast, other participating African nations were Morocco, Senegal, Upper Volta, Mali, Dahomey, Cameroon, Gabon, Congo-Brazzaville, Chad, and Burundi.



The conference was called and conducted as a seminar for the exchange of ideas and information toward the overall joint aim of the African fisheries. All of the participating nations were represented, in most cases, by each country's Fisheries Service Chief but no formal action was taken because the participants were not accredited as officially representing their countries.

Discussions at the seminar included a fairly wide range of discussions, and a report of the fisheries situation in his country was given

by each of the African participants. A consensus of views on certain points, as noted in the Draft Conference report, included: (1) a recognition of the need for conservation measures; (2) a recommendation for intensified development of fresh-water fisheries, including artificial impoundments; (3) a recognition of the value of intercountry training in fisheries; (4) a recommendation for more emphasis on modern industrial methods of fishing rather than the traditional methods; (5) a realization of the need for knowledge of resources, market potential, and effect on the national economy in planning fisheries development; (6) a recognition of the need for adequate training of fisheries personnel either within each country or at regional training facilities; (7) a realization of the importance of establishing a feeling of confidence in and cooperation with the fisheries service on the part of the fishing industry; (8) a recognition of the need for international fishery commissions for research and conservation; and (9) a hope that the Regional Fisheries Commission for West Africa will become more active. (Regional Fisheries Attache, United States Embassy, Abidjan, April 3, 1965.)

EUROPEAN ECONOMIC COMMUNITY

IMPORT QUOTAS SET FOR SELECTED FISHERY PRODUCTS IMPORTED BY WEST GERMANY AND BELGIUM-LUXEMBOURG:

On March 29 and 30, 1965, the Commission for the European Economic Community (EEC) announced decisions granting tariff quotas to West Germany and Belgium-Luxembourg for selected fishery products during various periods in the fiscal year ending March 31, 1966.

Under those quotas, West Germany will be able to import fresh and frozen fishery products as follows:

Herring (*Clupea harengus*) and sprat (*Clupea sprattus*): 85,000 metric tons duty-free between June 16, 1965, and February 14, 1966.

International (Contd.):

Dogfish shark (*Squalus acanthias*): 3,000 tons at 3-percent duty between April 1, 1965, and March 31, 1966.

Cod, pollock, haddock, and "black" halibut: 10,500 tons between August 1 and December 31, 1965. "Black" halibut will be subject to an import duty of 2.2 percent, but other items under that quota enter duty-free.

West Germany was also granted an import quota for 1,300 tons of salted pollock (for canning) at 7-percent duty between April 1, 1965, and March 31, 1966.

Belgium-Luxembourg was granted an import quota for 90 tons of certain crab and shrimp (destined for canning) at 3-percent duty between April 1, 1965, and March 31, 1966. (United States Mission to the EEC, Brussels, April 14, 1965.)

FISH MEAL

PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY 1965:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Country	January		Jan.-Dec.	
	1965	1964	1964	1963
	. . . (1,000 Metric Tons). . .			
Chile	9.0	11.8	137.8	86.8
Angola	1/	4.8	56.0	30.0
Iceland	9.6	11.5	124.3	99.1
Norway	13.2	27.2	179.4	104.1
Peru	164.9	101.9	1,416.5	1,159.7
So. Africa (including S.-W. Africa)	11.3	13.4	226.5	199.0
Total	208.0	170.6	2,140.5	1,678.7

The FEO countries produced 2.3 million metric tons of fish meal in 1964 or about 70 percent of total world production estimated at 3.3 million tons.

Fish meal exports by FEO countries in January 1965 totaled 208,000 tons, an increase of about 22 percent from the same month of the previous year. Peru accounted for about

Table 2 - Production of Fish Meal by Member Countries of the FEO, January 1965

Country	January		Jan.-Dec.	
	1965	1964	1964	1963
	. . . (1,000 Metric Tons). . .			
Chile	12.9	21.8	147.0	92.7
Angola	1/	5.6	59.7	31.5
Iceland	4.2	5.7	127.7	87.7
Norway	5.9	8.7	185.9	132.2
Peru	194.1	195.5	1,552.3	1,159.2
So. Africa (including S.-W. Africa)	8.7	14.0	257.4	238.0
Total	1/ 225.8	251.3	2,330.0	1,741.3

1/ Data not available.

79 percent of total fish meal exports reported by FEO countries in January 1965.

FOOD AND AGRICULTURE ORGANIZATION

ADVISORY COMMITTEE ON MARINE RESOURCES RESEARCH MEETS IN ROME:

The increasing pollution of the world's marine fishing waters must be combated, fisheries scientists agreed at the annual meeting of the Advisory Committee on Marine Resources Research, Food and Agriculture Organization (FAO), held in Rome, March 1-8, 1965. In its final report the Committee says, "... marine pollution is, in certain areas, becoming a serious problem and one of increasing concern with regard to its effects on fisheries resources. Knowledge of these effects is inadequate, although it is believed that they are becoming of such magnitude that new measures of international control of marine pollution are needed."

The Committee's report says that a study of pollution should not only cover contamination of marine waters by discharge from ships, from drilling the seabed for oil and natural gas, and the disposal of radioactive wastes, but should deal with contamination by noxious chemicals (including pesticides), sewage, rubbish, old ammunition, and other urban, industrial, and agricultural wastes. The report also says there is an urgent need for greater scientific knowledge of the living resources of the sea if man is to harvest them to his best long-term advantage. The rapid growth of modern fishing operations may lead to the damaging depletion of some fish stocks before research has revealed the limits of their safe annual yield, the report continued.

The Advisory Committee also discussed the possible future use of new and speedier

International (Contd.):

ways of mapping fish abundance, including the use of underwater television and echo-sounding equipment, sometimes combined with aerial surveys.

The Committee urged the speedy strengthening of present regional fisheries bodies and, where necessary, the establishment of new ones. A case in point was the proposed Atlantic Tuna Commission. Their report says that "while the lengthy national and international procedures are being followed, tuna fishing in the Atlantic continues to develop rapidly, in the absence of any adequate international effort to organize the collection of biological statistics and undertake the urgently-needed studies of the biology and state of tuna stocks in the area."

The Committee report also noted proposals made earlier by FAO's Director-General: (1) the establishment of a permanent committee composed of senior fisheries officials of selected FAO member nations, (2) the launching of a world program of marine resources research, and (3) it endorsed a major strengthening of FAO's work in fisheries. The Committee recommended that more studies be carried out on changing fish populations and the improvement of international cooperation in the study and conservation of these.

The Advisory Committee on Marine Resources Research is made up of 15 outstanding fisheries scientists from 11 countries. It also is the advisory group on the oceanographic aspects of fisheries to the Intergovernmental Oceanographic Commission under the United Nations Educational, Scientific and Cultural Organization (UNESCO). It also advises on fisheries aspects of several big international expeditions, some of which are in progress and some planned. (Food and Agriculture Organization, Rome, March 9, 1965.)

Note: See Commercial Fisheries Review, April 1964 p. 42.

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WORLD FISHERY TRADE IN 1963:

The value of international trade in fish and fishery products reached an all-time high of at least US\$1,686 million in 1963, the latest year for which world fishery statistics are available, according to the 1963 Yearbook of Fishery Statistics (Vol. 17), published by the Food and Agriculture Organization (FAO). The Yearbook shows the 1963 value to be \$89

million above the previous high of \$1,597 million reported for 1962.

About one-third of the 1963 record world fishery catch of 46.4 million metric tons crossed at least one international border between the time the fish were caught and when they were placed before the housewife. The 15.2 million tons of fishery products going into international trade represented the live weight as they came out of the water and not the final weight of the products--fresh, frozen, or otherwise processed--as sold to the public.

The FAO Yearbook data include trade statistics for the Union of Soviet Socialist Republics. They do not include trade data for Mainland China, for which fishery catch estimates are based entirely on outside information. The Yearbook's data are based on fishery statistics reported to FAO by 140 countries which accounted for 41 million tons, or 88 percent of the 1963 world catch. About 37 percent of the total catch of those countries went into international trade.

The new FAO publication gives the disposition of the 1963 fishery catch whether sold at home or abroad, such as: marketed fresh 16.4 million tons; frozen 4.7 million tons; cured as smoked, dried, and salted fish 8.3 million tons; canned 4 million tons; for processing into fish meal meal or oil 12 million tons; used for other purposes ranging from fish sticks to fertilizer 1 million tons.

The percentage of the world fishery catch going into international trade has risen steadily since the end of World War II; in 1958 it was 29 percent and in 1948, when FAO began compiling world fishery statistics, it was about 19 percent.

In 1963 there were 19 nations which caught 500,000 or more tons of fish. The top 5 nations were Peru (6,901,300 tons); Japan (6,697,800); Mainland China (5 million); the U.S.S.R. (3,977,200); and the United States (2,711,900). (Food and Agriculture Organization, Rome, March 21, 1965.)

INTER-AMERICAN TROPICAL TUNA COMMISSION

ANNUAL MEETING:

A quota of 81,800 tons for the catch of yellowfin tuna in the eastern Pacific for 1965 was recommended by the Inter-American Tropical Tuna Commission at its 17th Annual Meeting in Mexico City, Mexico, March 23-26, 1965. This will restore the resource in about 4 years to

International (Contd.):

a level which will produce the maximum sustainable annual yield of 91,500 tons. The member nations, Costa Rica, Ecuador, Mexico, Panama, and the United States, also pledged themselves to do everything legally possible to induce other nations which fish in the area to cooperate in the regulatory program.

Other nations which fish tuna in the eastern Pacific are Peru, Japan, Chile, and Colombia. The average catch of yellowfin tuna in the eastern Pacific in the four-year period ending with 1964 was 93,991 tons, shared by the member and nonmember nations as follows:

Country	Average Catch Yellowfin Tuna 1961-1964	Percentage of Average Total Catch
	<u>Short Tons</u>	<u>%</u>
United States	77,124	82.0
Peru	8,965	9.5
Japan	4,127	4.3
Mexico	2,051	2.2
Ecuador	975	1.3
Costa Rica	333	0.3
Chile	283	0.3
Colombia	133	0.1
Panama	0	0.0

All the countries, with the exception of Peru and Chile, have pledged themselves to put regulations into effect when this becomes necessary. If the regulatory program is to be effective, however, all countries which fish yellowfin tuna in the regulatory area must cooperate. Peru and Chile so far have refused to cooperate under conditions acceptable to most member nations of the Tuna Commission. Hence, although the Commission has recommended regulation of the fishery each year since 1962, the fishery has not been controlled.

The United States Delegation at the meeting consisted of Commissioners J. L. McHugh (Head of the Delegation), Washington, D. C., Robert L. Jones of Gearhart, Oreg., and John G. Driscoll, Jr., of San Diego, Calif.; Advisers William C. Herrington and Fred E. Taylor of the U. S. Department of State; Donald R. Johnson, Regional Director, U. S. Bureau of Commercial Fisheries, Terminal Island, Calif.; Richard Croker, Fishery Attache, U. S. Embassy, Mexico City, Mexico; Philip M. Roedel, Director, California State Fisheries Laboratory, Terminal Island; and the following representatives of the tuna industry: Lester Balinger, John Calise, Charles Carry,

Clifton Day, August Felando, Anthony Nizetich, John Royal, and George Steele.

INTERGOVERNMENTAL MEETING ON REGULATION OF TUNA FISHERIES IN EASTERN PACIFIC:

The Intergovernmental meeting on March 25 and 26, 1965, was attended by Delegates or Observers from the nine nations already mentioned, plus Canada, El Salvador, Guatemala, Honduras, and Nicaragua. The United States Delegation at the meeting consisted of William C. Herrington (Head of the Delegation) and William M. Terry of the Office of the Commissioner of Fish and Wildlife, with the members of the Tuna Commission delegation as advisers. The principal purpose was to reach agreement on a cooperative scheme for effective control of the yellowfin fishery. Peru and Chile, however, required subquotas of 12,000 tons and 5,000 tons, respectively, as the price of cooperation. This was not acceptable to most of the other voting nations, and no agreement was reached on this point. It was agreed, however, that the member nations of the Inter-American Tropical Tuna Commission would meet again soon to develop methods to obtain the cooperation of other countries.

Note: See *Commercial Fisheries Review*, May 1964 p. 42.

NORTHWEST PACIFIC FISHERIES COMMISSION

PROGRESS OF JAPAN-U.S.S.R. FISHERIES NEGOTIATIONS:

The Ninth Annual Meeting of the International Northwest Pacific Fisheries Commission convened at Tokyo, on March 2, 1965. On March 5, the Scientific Subcommittee of the Commission began evaluating the condition of salmon resources.

The Subcommittee arrived at the conclusion that the 1965 chum, silver, and king salmon run would be at about the same level as in 1964 and that the 1965 pink run would be at a level comparable to the 1963 run and well above the 1964 run. The Subcommittee acknowledged that the Asian red salmon resource had declined greatly but was not able to reach agreement as to the cause of that decline. The Soviet Union claimed overfishing by Japanese vessels to be the primary cause, while Japan claimed the decline may have its origin in natural oceanic conditions.

The Soviet Union's red salmon catch for the past four years was reported to be: 1961--7,834 metric tons; 1962--4,649 tons; 1963--3,443 tons; and 1964--2,692 tons. The 1964 red salmon run to the Ozernaya River, which

International (Contd.):

contributes 70-80 percent of the total Asian run, was reported to be disastrous. Although Japan and the Soviet Union were not able to agree as to whether the 1965 Ozernaya run would be above or below the 1964 level, they were in general agreement that the depletion was serious.

At the plenary session on March 18 the Soviet Union was reported to have proposed that Japan should reduce her salmon fleet in Area B (south of 45° N. latitude) by over 50 percent and, at the same time, expand the closed areas and shorten the fishing season in that area. Japan is said to have rejected the Soviet proposal. (Suisan Keizai Shimbun, March 19 & 24; Suisan Tsushin, March 11, 1965; and other sources.)

* * * * *

JAPANESE SALMON CATCH QUOTA FOR 1965 IN WESTERN PACIFIC:

Agreement on a 1965 Japanese salmon catch quota of 115,000 metric tons in the western Pacific (off the coasts of Japan and the U.S.S.R.) was reached March 31, 1965, at the ninth annual meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.).

The 1965 Japanese salmon quota in the western Pacific provides for a catch of 56,000 tons in Area A (north of 45° N. latitude) and 59,000 tons in Area B (south of 45° N. latitude). That is an increase over the 1964 quota of 1,000 tons in Area A and 4,000 tons in Area B. Other regulations were unchanged from 1964.

The Japanese red salmon catch target for Area A was set at 7.75 million fish of which not more than 2.5 million are to be taken west of 165° E. longitude.

The Japanese press reported mixed reactions in the fishing industry. A spokesman for the Japanese Salmon Drift-Net Association (land-based fishery) expressed dissatisfaction that Japan's request for a 120,000-ton quota was not obtained.

On the other hand, the president of the Japanese Fishery Association said that although the agreement does not satisfy all segments of the salmon industry, he hailed the outcome of negotiations as setting a good precedent and offering bright prospects for

future negotiations. (United States Embassy, Tokyo, March 31, 1965.)

(Note: The Northwest Pacific Fisheries Commission on March 24, 1965, agreed on a 1965 king crab catch quota in the western Pacific of 240,000 cases (48 ½-lb. cans) for Japan and 420,000 cases for the U.S.S.R.)

Note: See Commercial Fisheries Review, May 1965 p. 53; Mar. 1965 p. 83; Jan 1965 p. 78; July 1964 p. 42.

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JAPANESE-SOVIET NEGOTIATORS SET KING CRAB CATCH QUOTA FOR 1965 IN WESTERN PACIFIC:

On March 24, 1965, an informal agreement on king crab quotas was reached by Japan and the U.S.S.R. at the ninth annual meeting of the Northwest Pacific Fisheries Commission. Japan's 1965 king crab catch quota was set at 240,000 cases (48 ½-lb. cans), a reduction of 12,000 cases from the previous year. The Soviet quota for 1965 was increased to 420,000 cases, or 42,000 cases above the 1964 quota. The new annual king crab quotas are to apply in both 1965 and 1966. The U.S.S.R. plans to operate 7 motherships in the king crab fishery in 1965 as compared to 6 in 1964. There will be no change in size in the Japanese fleet of 4 king crab motherships.

The Northwest Pacific Fisheries Commission sets salmon and king crab catch quotas for waters in the Sea of Okhotsk and in the Bering Sea off Kamchatka. (United States Embassy, Tokyo, March 25, 1965.)

Note: See Commercial Fisheries Review, Mar. 1965 p. 83; Jan. 1965 p. 78; July 1964 p. 42.

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JAPANESE-SOVIET NEGOTIATORS AGREE ON JOINT INSPECTION OF SALMON FISHERY IN NORTHWEST PACIFIC AREA B:

On March 27, 1965, at the ninth annual meeting of the Northwest Pacific Fisheries Commission, informal agreement was reached between the U.S.S.R. and Japan on supervision of the Japanese salmon fishery in Area B (south of 45° N. latitude) along the following lines: (1) Regulations to be jointly enforced by Japanese and Soviet inspectors aboard Japanese patrol vessels only; (2) Japanese to increase number of patrol vessels from 4 operated in 1964 to 5 during current season; (3) one Soviet inspector with interpreter to board each Japanese patrol vessel; (4) joint enforce-

International (Contd.):

ment expanded to cover Japan sea area of Convention waters. (United States Embassy, Tokyo, March 30, 1965.)

NORTH ATLANTIC OCEAN

FISHERY CATCH AT RECORD HIGH IN 1963:

A record 10.7 million metric tons of fish were caught in the North Atlantic Ocean in 1963, according to the Food and Agriculture Organization (FAO). The 1963 catch was 510,000 tons above the previous high of 10.2 million tons in 1962, and accounted for just under one-quarter of the record 1963 world fishery catch of 46.4 million tons.

Leading the nations taking a part, or all, of their 1963 catches from the North Atlantic, was the Soviet Union with 1,679,093 tons. The Soviet total 1963 catch from all fishing areas was 3,977,200 tons. Norway was in second place with 1,330,979 tons. Practically all of Norway's total 1963 catch of nearly 1,387,800 tons came from North Atlantic waters. All other nations fishing the North Atlantic took less than a million tons from it.

Nations catching 500,000 or more tons were Denmark (including Faroe Islands) with 975,730 tons; the United Kingdom 944,266; Spain 810,811; Canada 801,184; Iceland 783,235; the Federal Republic of Germany 636,346; and France 546,002 tons. North Atlantic catches by other nations in 1963 included Portugal with 485,489 tons; United States 464,560; Netherlands 350,310; Sweden 339,798; Poland 198,682; East Germany 177,203; Belgium 61,901; Finland 60,954; Greenland 33,290; and Ireland 27,642. (Food and Agriculture Organization, Rome, March 10, 1965.)

SOVIET-NORWEGIAN TALKS ON FISHERIES

Norway and the Soviet Union announced that they would urge international measures to protect the cod stocks in the Barents Sea, now subjected to heavy exploitation. With a view to reaching a speedy solution, the Fisheries Ministers of the two countries agreed that such measures should be discussed at the 3rd session of the Commission on North Atlantic Fisheries, which was to be held at Moscow in May 1965.

During the Soviet Minister's 12-day visit in Norway during March, the two officials also

discussed other questions, including mandatory increase of the mesh size in trawls and nets, ban on protective nets, and regulation of the catch intensity. They welcomed in principle a British proposal for a conference of experts to draft regulations that would ensure maintenance of order on fishing grounds in international waters.

The Fisheries Ministers of both countries stressed the importance of continued cooperation between Norwegian and Soviet oceanographers to strengthen fishery research in the Northeast Atlantic.

The communique said the Norwegian Fisheries Minister has accepted an invitation to pay an official visit to the Soviet Union at a future date. (*News of Norway*, March 25, 1965, Norwegian Information Service, Washington, D. C.)

LAW OF THE SEA

CERTAIN INTERNATIONAL CONVENTIONS RATIFIED BY FINLAND:

On February 16, 1965, the Government of Finland deposited its ratification of the four Law of the Sea Conventions: The Convention on the Territorial Sea and Contiguous Zone; the Convention on the High Seas; the Convention on the Continental Shelf; and the Convention on Fishing and Conservation of the Living Resources of the High Seas.

Finland's ratification of the Convention on Fishing and Conservation brings the total number of ratifying countries to 18. A total of 22 ratifications are needed before the Convention enters into force. The other three Conventions have already entered into force.

The Conventions ratified by Finland were formulated at the United Nations Conference on the Law of the Sea at Geneva on April 29, 1958.

Note: See *Commercial Fisheries Review*, Mar. 1965 p. 83; Jan. 1965 p. 59; Dec. 1964 p. 39; Nov. 1964 p. 70; Oct. 1964 p. 49.

WHALING

ANTARCTIC CATCH FALLS SHORT OF QUOTA IN 1964/65 SEASON:

Total Antarctic whale production of the three whaling nations (Japan, Soviet Union, and Norway) during the 1964/65 season amounted to 6,984 blue-whale units, according to data released by the International Whaling Commission. Their total catch not only failed to reach the international catch target of 8,000

International (Contd.):

blue-whale units but marked a record low, falling far below the 8,428 units harvested in 1963/64 and 11,299 units in 1962/63.

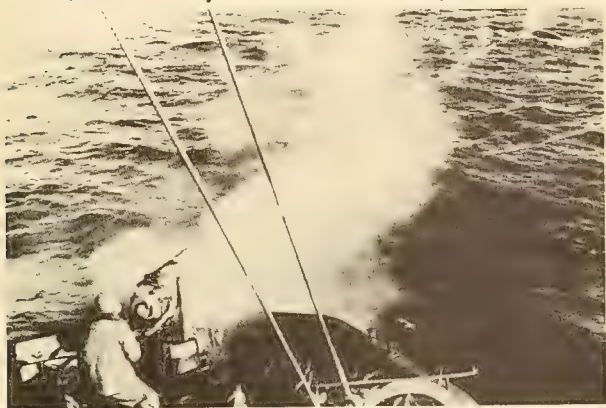


Fig. 1 - Gunner aboard a Japanese whale-hunting vessel shoots harpoon into whale (upper right corner).

The seven Japanese whaling fleets participating in the 19th Antarctic Whaling Expedition (1964/65) had almost reached their quota when the Antarctic season closed April 7, 1965. The combined catch of the seven Japanese fleets totaled 4,125 blue-whale units, only 35 units short of Japan's international whale catch quota of 4,160 blue-whale units. (Suisan Keizai Shimbun, April 9 & 13, 1965.)



Fig. 2 - Cutting up whale aboard a Japanese whaling mothership in Antarctic.

According to newspaper reports in Oslo, Norway, the Soviet Antarctic catch in 1964/65 of 1,586 blue-whale units was also very close to its quota of 1,600 units. But Norway's Antarctic catch in 1964/65 of 1,273 blue-whale units was far below its quota of 2,240 units. The Norwegian newspapers mentioned Norway's aging whaling fleet as a factor in the poor catch. The four Norwegian expeditions caught 5,535 sei whales and 702 fin whales in the 1964/65 Antarctic season, as compared with 2,097 fin whales and 2,617 sei whales in the previous season. (United States Embassy, Oslo, April 14, 1965.)

Note: For details on Norwegian whale oil production see page 69 of this issue.



Angola

FISH MEAL INDUSTRY MODERNIZATION PROGRAM AIDED BY GOVERNMENT LOAN:

According to Angola newspaper reports, a contract was signed February 18, 1965, for a loan of 15,000 contos (about US\$500,000) by the Portuguese Development Bank to the Fishing Industries Institute of Angola. The loan will help finance a project to modernize Angola's fish meal industry. Total cost of the project is said to be 40,000 contos (\$1.4 million), part of which will be provided by the Government Fund for the Support of the Fishing Industry.

At the signing of the loan contract, the Director of the Fishing Industries Institute of Angola said the modernization project includes plans to: (1) equip fish meal factories with modern equipment to extract fish oil; (2) equip them with fuel oil rather than wood burners; (3) install power blocks on purse-seine vessels; (4) equip isolated fish processors with small fish-meal units and, generally, to provide the financial means for full utilization of fish waste throughout the industry; (5) replace obsolete equipment in certain fish-meal factories; and (6) install a fish-processing plant in Porto Alexandre to replace the existing ones which do not meet minimum standards.

Emphasis appears to be on government support for modernization of present installations rather than for promotion of new processing plants. That is in line with the expressed thinking of the Fishing Institute Director that private industry must provide the

Angola (Contd.):

large sums needed to expand the processing industry. (United States Consulate, Luanda, March 3, 1965.)



Argentina

IMPORT CHARGES REDUCED ON CERTAIN FISHING VESSELS:

A change in Argentina's import charges on fishing vessels may offer an export opportunity to United States shipbuilders.

To stimulate the renewal of the Argentine fishing fleet, the Argentine Government issued a decree (No. 664/1965) which provides for surcharge exemption on imports of new foreign fishing vessels to be used as models for local vessel construction. The conditions necessary for waiver of the 40-percent import surcharge are: (1) that work on an Argentine "copy" of the imported foreign vessel begin within 180 days of the date the foreign vessel joins the Argentine fishing fleet, and (2) that the Argentine "copy" cost more than the foreign "model." If the copy is less expensive than the model, the 40-percent surcharge must be paid on the difference between the two costs.

The Argentine fishing industry is interested in rehabilitating and modernizing its fleet. However, financing is a big problem not only for the fishing industry but also for the Argentine shipbuilders. Special credit programs of the official banking system are offering a certain amount of assistance. The surcharge exemption on fishing boats imported for models should help the Argentine industry and also provide an export opportunity for foreign shipyards. (United States Embassy, Buenos Aires, April 12, 1965.)

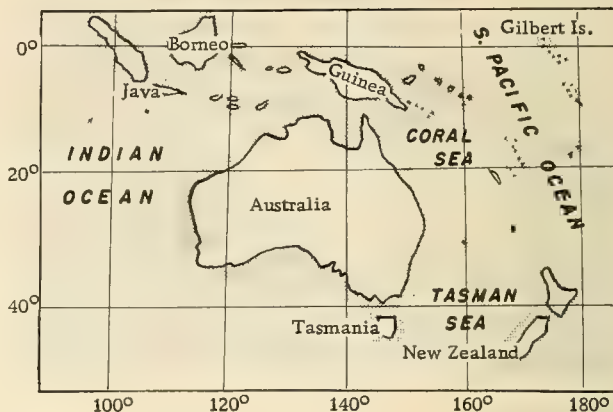


Australia

TUNA FISHERIES TRENDS, EARLY 1965:

By mid-January, the 1964/65 tuna fishing season off New South Wales on the east coast of Australia was virtually over and the main tuna fleet had sailed for Port Lincoln to prepare for the South Australian tuna season.

Tuna landings in New South Wales to January 20, 1965, were only 2,310 short tons, nearly 700 tons short of the record 1963/64 catch. Bad weather was a factor in the disappointing 1964/65 season.



In February 1965, a Government tuna exploratory project was due to start off Tasmania. Two chartered tuna vessels supported by spotting aircraft were to carry out the experimental fishing tests. (Australian Fisheries Newsletter, February 1965.)



Brazil

GOVERNMENT ASSISTANCE PROGRAMS PLANNED FOR FISHERIES:

Since a change in the administration of SUDENE (Brazil's Federal Government development agency for the Northeast region) in August 1964, that agency has been assigning a higher level of priority to the fishing sector it considers basic to the economic development of that region of Brazil.

A comprehensive research program to supply basic information to the Brazilian fishing industry was presented by the Division of Fishing Resources of SUDENE to the Deliberative Council at its meeting of April 7, 1965. The program includes studies of fishing technology and of the biology of various commercially-important species such as tuna, snapper, flyingfish, mackerel, lobster, shrimp, and mussel ("sururu" -- a miniature mussel native to the lagoons of Alagoas and basic to the economy of the state), as well as experiments with various methods of preserv-

Brazil (Contd.):

ing fish such as salting and drying. The total cost of the program for the year 1965 is budgeted at Cr\$544 million (US\$300,000). The program is intended to provide information basic to the implementation of the Program for the Integrated Development of Fishing (Programa do Desenvolvimento Integrado da Pesca), which was to be reviewed by the SUDENE Deliberative Council on May 3, 1965.



Fig. 1 - Fishing vessels at the dock in Santos, Brazil.

In its justification for the program, the Division of Fishing Resources states that "the complete absence of developmental research combined with a fragile and inadequate infrastructure, the lack of knowledge of rational fishing methods, and the traditional utilization of primitive techniques have constituted the major obstacles to the development of fishing in the Northeast. Other obstacles were said to be the physical peculiarities of the Northeastern Continental Shelf, and the biological and ecological habits of its fish population. Those factors were said



Fig. 2 - Boxes of shrimp on the docks at Santos.

to have made it difficult to introduce fishing methods commonly used in other areas, such as trawling.



Fig. 3 - In the Entreposto at Santos, fish are iced, landed on trucks, and delivered to Sao Paulo for distribution.

The report outlines the fishing development philosophy of SUDENE as "The urgent necessity of offering to the people of the Northeast a diet which will make up for protein deficiencies at a reasonable cost has led SUDENE, through its Division of Fishing Resources, to draw up a program which, it is hoped, will scientifically demonstrate the rich potential existing in Northeastern waters; determine the dynamics of the fish populations already subject to exploitation; and introduce more efficient methods and techniques to render already operating enterprises more efficient and productive. More efficient conservation and processing methods are also aimed at as well as the processing of byproducts. The program also includes juridical, administrative, and institutional studies which may influence the development of the fishing industry."

The SUDENE research program is broken-down as follows:

1. Studies of Fishing Technology:

Survey of marine resources of the Northeast.

Experimentation with fishing methods & techniques.

Specialized equipment.

2. Studies of Fishing Biology:

To include fishing of tuna and similar fish, snapper, flyingfish, mackerel,

Brazil (Contd.):

lobster, shrimp, mussels, and specialized equipment.

3. Studies of Fishing Technology:

Experiments in drying & salting of flying fish.

Fishing statistics (flyingfish).

Experiments in pressing of fish.

4. Training and specialization of technical personnel.

SUDENE Activities in Fishing Sector during 1964: A number of studies and projects were conducted by SUDENE during 1964, the most significant of which were:

1. Analysis of sample catches of tuna, albacore, snapper, flyingfish, and mackerel for age and weight, growth and reproduction cycles, dietary habits, etc.
2. Tagging of lobsters for migration studies.
3. Studies of shrimp from 13 different banks for size and weight.
4. Inception of study of the miniature mussel ("sururu") at Lagoa do Mundau, Alagoas.

6. Experiments on the pressing and salting of flyingfish, needlefish, and swordfish.
7. Survey of the freezing and cold-storage capacity existing in the Northeast region.
8. Preparation of two projects for establishment of fishermen's cooperatives in Rio Grande do Sul.
9. Sale of fishing equipment to fishermen through PENESA (an operational fishing company controlled by SUDENE).
10. Operational fishing by PENESA with two vessels--the Canopus (18-ton capacity) and the Colombo (42-ton capacity).

Source: U. S. Consulate, Recife, April 8, 1965.

Note: See Commercial Fisheries Review, April 1965 p. 61; March 1965 p. 68.



Canada

BRITISH COLUMBIA HERRING LANDINGS AND PRODUCTS, 1964/1965:

Total herring landings in British Columbia during the 1964/65 season were down about 8 percent from the previous season. Compared with the previous season, fish meal production in 1964/65 was down 8 percent, but fish oil pro-

British Columbia Herring Landings and Products, 1964/65 Season with Comparisons

Item	Unit	Season Ending:					
		Mar. 27, 1965	March 28, 1964	Mar. 10, 1963	Mar. 10, 1962	Mar. 18, 1961 ^{1/}	Mar. 12, 1960 ^{1/}
Landings:							
District No. 2:							
Northern	Tons	46,632	35,016	42,792	33,254	47,088	23,239
Central	"	22,107	56,123	62,626	39,032	43,505	10,919
Queen Charlotte Islands	"	46,985	32,582	19,856	16,604	2,896	3,121
District No. 3:							
Lower East Coast	"	37,849	66,216	55,665	51,821	31,309	55,582
Middle East Coast	"	23,845	20,347	24,707	20,561	10,023	20,014
Upper East Coast	"	18,672	15,513	10,697	13,294	2,978	10,005
West Coast . . .	"	44,490	36,248	49,304	49,595	34,142	62,273
Total landings	"	240,580	262,045	265,647	224,161	171,941	185,153
Products Produced:							
Bait	"	893	1,128	886	575	1,619	848
Meal	"	43,062	46,778	48,035	39,535	31,014	34,492
Oil	Imp. Gals.	5,436,358	4,877,688	4,771,087	4,676,991	2,956,948	4,585,307

^{1/}Limited operations.

5. Survey of fisheries lying off the Island of Fernando de Noronha.

duction was up 11 percent. (Canadian Department of Fisheries, Vancouver, March 31, 1965.)
Note: See Commercial Fisheries Review, June 1964 p. 37.

* * * * *

Canada (Contd.):

FRESH-WATER FISHERIES DEVELOPMENT DISCUSSED BY FEDERAL-PROVINCIAL COMMITTEE:

The Canadian Federal-Provincial Prairie Fisheries Committee met the first week of April 1965. Proposals for loan and marketing assistance for inland fisheries as well as a broad group of other development proposals were reviewed by the Committee, which is made up of Deputy Ministers of Federal and Provincial Departments concerned with inland fisheries.

A regional export sales organization for fresh-water fishery products was one proposal considered at the April meeting. A technical group was asked to study the proposal and report back to the Committee at a meeting to be held in Ottawa on May 7.

The Committee also considered proposals made by subcommittees on suggested designations of grades of fish and standards of quality for the fishery products of the Prairie Provinces, the Northwest Territories, and northwestern Ontario.

A report on the concept of Provincial loan boards and its possible application to the Prairie Provinces was also considered. Federal officials gave the Committee an outline of the Fishing Vessel Assistance Plan and the problems associated with its possible extension to the Prairie Provinces.

Another report heard by the Committee was on the Federal Government's Fisheries Indemnity Plan for vessels and equipment, and it was agreed that the inland Provinces should advise the Federal Government regarding their interest in extension of the plan to their fisheries. It was indicated that the Federal Government would give serious consideration to such an extension.

Other matters considered at the meeting were plans for economic research in the fresh-water fisheries of Canada and development of an improved statistical system for those fisheries. Federal-Provincial programs in Newfoundland were described for the benefit of the Prairie members of the Committee. Biological and technological research programs in fresh-water fisheries were discussed by the Chairman of the Fisheries Research Board of Canada. (Canadian Department of Fisheries, Ottawa, April 9, 1965.)

Ceylon**FISHING INDUSTRY AIMS AT FIVEFOLD INCREASE IN CATCH:**

Ceylon, an island country of 12 million people, is aiming at a fivefold increase in its annual fish catch within the next 10 years.

A marine engineer with the Food and Agriculture Organization (FAO) who recently returned from a 12-year assignment in Ceylon said: "Ceylon has already come a long way in fishing. In 1948, the year she gained her independence, the national catch was 24,000 metric tons. Last year's catch, despite a devastating cyclone in December, was above 100,000 tons." Even so, 2 of every 3 pounds of fish sold in the country were imported and paying for the imported fish was a strain on the nation's exchange earnings, he said. "The Ceylonese need about 300,000 tons a year to reach self-sufficiency. And, of course, they would like to develop an export trade in fish and fish products. That's why they have set a yearly catch of 500,000 tons as their long-range goal."



Fig. 1 - An FAO technologist helps Ceylonese fishermen fit an outboard motor to a log raft known as a "teppam."

Heading the drive for more fish is the Government-managed Ceylon Fisheries Development Corporation, which was organized in late 1964. The first job facing the new corporation is rebuilding that part of the Ceylonese fishing fleet that was destroyed or damaged by last year's cyclone. To help rebuild its fleet, the Ceylonese Government has received a contribution of US\$16,800 from the National Freedom from Hunger Campaign Committee of the United Kingdom, a gift of modern fishing equipment worth \$4,500 from Denmark, and a pledge of \$56,000 from the World Council of Churches.

Ceylon (Contd.):

On the long-range front the Ceylonese are also looking for outside help. The FAO marine engineer who has just returned from Ceylon said, "The Ceylonese know they can't do the whole job by themselves. They are trying very hard to make prospects attractive to private interests. They need foreign capital in almost every sector of the fishing industry; to pay for more boats and fishing equipment, for harbor development, communications, marketing facilities, and for construction of new storage and preservation plants."



Fig. 2 - Ceylonese fishermen land a swordfish taken by long-line fishing.

The Ceylonese like fish as much as the Japanese. The average Ceylonese eats about 45 pounds of fish a year. The principal fish taken in the national catch are various forms of sardines, skipjack, frigate mackerel, snapper, and bottomfish. Most of Ceylon's fishery imports, largely dried and salted fish, come from neighboring India and Pakistan and the Maldive Islands.

By increasing her own fisheries catch, Ceylon has managed to reduce the per capita cost of imports by better than half in the last 10 years, according to the FAO marine engineer. "When I got to the country, the Ceylonese, with a smaller population, were paying out about \$20 million a year for fish imports. Last year, with more people, this was down to \$12 million," he said.

Fifteen years ago not one of Ceylon's approximately 20,000 fishing craft had a motor. Since then, a mechanization program started with FAO assistance has equipped some 1,500 native Ceylonese craft with outboard motors. About 800 inboard-powered boats of 25 feet

or more have also been built under the mechanization program. Fishing fleet improvement, along with the introduction of modern gear and the training of local fishermen, has accounted for Ceylon's increased catch.

Note: See *Commercial Fisheries Review*, Nov. 1964 p. 80; Oct. 1962 p. 48; Dec. 1962 p. 65.



Chile

FISH MEAL INDUSTRY CONTINUES TO SUFFER FROM ANCHOVETA SHORTAGE IN EARLY 1965:

Preliminary data for 1965 show the Chilean anchoveta catch as only 84,000 metric tons in January and 67,000 tons in February. Those landings are much less than the corresponding monthly catches in 1964 of 160,000 tons and 148,000 tons, respectively.

Late in February 1965, a spotter plane provided by the Fisheries Development Institute of Chile located schools of anchoveta in waters near Mejillones, and some 30,000 tons of anchoveta were taken between February 24 and March 2, largely by vessels based at the port of Iquique. However, the catch dropped off again in early March 1965.

The Fisheries Development Institute is requesting funds from the Production Development Corporation of Chile (CORFO) to permit it to continue fish spotting for the industry as a whole. The Institute plans to equip the spotter plane with an infrared thermometer capable of measuring water temperatures within half a degree centigrade. According to current theory, anchoveta are only found where water temperature is between 14° and 18° C. (57.2°-64.4° F.). Use of the thermometer should thus permit the plane to find those areas in which fishing conditions are most favorable. Commercial spotter planes have been used by individual companies, but reportedly without great success, since other vessels were quick to pick up radio signals and take advantage of the service without paying for it.

Iquique, the center of the Chilean fish meal industry, has been hit hardest by the anchoveta shortage. Anchoveta landings at Iquique have been far below the 25,000 tons per week needed for financially successful operations. It is estimated that 100 vessels (12-13 men per vessel) have been staying in port during

Chile (Contd.):

the past several months due to the absence of anchoveta.

While the Iquique industry was thus depressed, anchoveta catches were somewhat more abundant in January off Arica, just south of the Peruvian border. In January 1965 Arica plants produced some 5,200 tons of meal valued at about \$450,000, augmented by 73,000 kilos (160,936 pounds) of fish oil worth \$14,000. That was close to Arica's production in the same month of 1964. During February 1965, however, landings in Arica fell to 9,200 tons (1,380 tons of meal), the lowest level for that month in the last 3 years.

The Iquique shipyard operated by a United States-Chilean firm announced in mid-February 1965 that 50 workers were to be laid off. It was explained that due to the long absence of anchoveta new vessel orders had not been received and some orders had even been cancelled. Despite the cutback, the shipyard will remain in Iquique for the time being and maintain a repair shop. Later in the year the company plans to begin construction of 82-foot refrigerated tuna vessels. (United States Embassy, Santiago, April 10, 1965.)



Costa Rica

IMPORTS OF CANNED SARDINES
RESTRICTED BY HEALTH AUTHORITY:

Importers of canned sardines in Costa Rica were sent a letter dated February 12, 1965, from the chief of Costa Rica's Food Control Office, Ministry of Public Health, setting forth the reasons for rejecting numerous shipments of canned sardines which had been shipped to that country from the United States, South Africa Republic, and other countries.

The letter referred to "pitting" of the tin due to weak coatings of lacquer and mottling of the lacquer in the tins. The chief of the Food Control Office admitted that while the product itself was found to be in good condition, the defect in the lacquer coating would reduce substantially the shelf life of the product in that tropical country.

Because of the approaching Holy Week in the Lenten Season, a period when consumption of canned sardines is heaviest in that country,

the clearance of shipments then in Costa Rican customhouses was authorized for that one time, but with the warning that two months after the date of the February 12 letter, clearance no longer would be authorized if shipments continued to reveal the same defects in mottling and flaking; and also if the food product was not duly registered in the country in accordance with Article 252 of the Sanitary Code of Costa Rica. Otherwise, shipments will be reexported, or confiscated and destroyed, the chief of the Food Control Office said.

Costa Rican Imports of Canned Sardines by Country of Origin, 1960-1964

Country of Origin	1964	1963	1962	1961	1960	Average 1960-64
	. . . . . (US\$1,000).					
United States	105	183	163	234	235	184
S. Africa Rep.	215	126	69	22	14	89
Spain	38	37	27	32	34	34
Morocco	51	44	25	17	22	32
Canada	13	14	1/	10	17	11
Netherlands	14	10	6	2	2	7
Other	17	49	22	16	21	24
Total	453	463	312	333	345	381

1/ Less than \$500.

Source: Direccion General de Estadisticas y Censos, Costa Rica.

The Costa Rican authorities' refusal to permit the entry of sardines in cans which show discoloration of the lacquer is expected to adversely affect exports of sardines to that country from the United States which heretofore has been the principal supplier. Costa Rica's total imports of canned sardines during the past five years have averaged US\$381,000 per year in value. Of that total, the United States accounted for 48.3 percent, and South Africa Republic (a country from which some U. S. packers export their product) 23.4 percent.

A Food Consultant on contract with the U. S. Agency for International Development (USAID/Costa Rica), who is considered well qualified to comment on the matter, suggests that the trouble actually is a harmless black spot inside the can as a result of a chemical reaction between the sulphides of the fish with a chemical in the lacquer. If there were also some peeling he feels that the can would not deteriorate to the extent that it would be dangerous to the consumer.

Earlier, Costa Rica's chief of the Food Control Office ordered the return of a shipment of sardines to the Netherlands because of discoloration in the lacquer. In order to

Costa Rica (Contd.):

avoid the future return of any of its shipments, the Dutch company changed to another type of lacquer (gray in color) which does not show discoloration. The fact that the change was made by the Dutch company has led Costa Rican authorities to believe that the earlier decisions to reject shipments which showed discoloration were justified. Indications are that only the product of that Dutch company will be permitted entry into Costa Rica after April 12, 1965, or until such time as other brands change their lacquer to one which shows no discoloration or peeling. (United States Embassy, San Jose, March 16, 1965.)



Denmark

EXPORTS OF INDUSTRIAL PRODUCTS, 1963-1964:

Danish exports of fish oil (largely herring) totaled 30,357 metric tons in 1964, compared with 20,754 tons in 1963.

Exports of herring meal, however, declined to 56,340 tons in 1964 from 60,389 tons in 1963. Shipments of other fish meal in 1964 increased to 4,948 tons from 1,846 tons in 1963, and those of fish solubles to 17,298 tons from 10,000 tons. (Foreign Agriculture, U.S. Department of Agriculture, April 12, 1965.)

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SEAL SKINS FROM ALASKA AND CANADA INCLUDED IN FEBRUARY 1965 AUCTION OF GREENLAND SEAL SKINS:

The Royal Greenland Trade Department held another of its regular auctions for Greenland seal skins of February 25, 1965, in Copenhagen, Denmark. Included were 680 Alaska hair seal skins designated as Alaska rangers (from younger and smaller seals) which sold at prices ranging from US\$30.40 to \$32.60 a skin. (That was the second appearance of Alaska skins at a Danish auction, the first lot of Alaska skins having been sold at the Danish auction of September 9, 1964, for \$31.10-38.40 for prime young washed rangers and \$22.45-39.80 for prime old washed rangers.)

Also included in the Danish auction in February were 1,275 Canadian seal skins. The

price ranges for the main lots of the Canadian skins were \$37.60-48.60 a skin for 695 washed rangers and \$14.50-32.60 for 261 washed saddlers (skins from older and larger seals).

Greenland skins sold at the auction included 32,872 ringed (netsider) skins which were sold at prices ranging up to \$40.30, but averaging somewhat less than in the previous auction when 21,316 ringed seal skins brought an average price of \$20.40 a skin. Prices at the two auctions are not entirely comparable since the February auction included a larger proportion of small and slightly damaged skins. Also sold at the February auction were 1,743 other Greenland skins (from harp, bladdernosed, and saddle seals) at prices ranging from \$3.80 to \$55.00.

The next sale of Greenland seal skins by the Royal Greenland Trade Department is scheduled for September 17, 1965. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 24, 1965.)

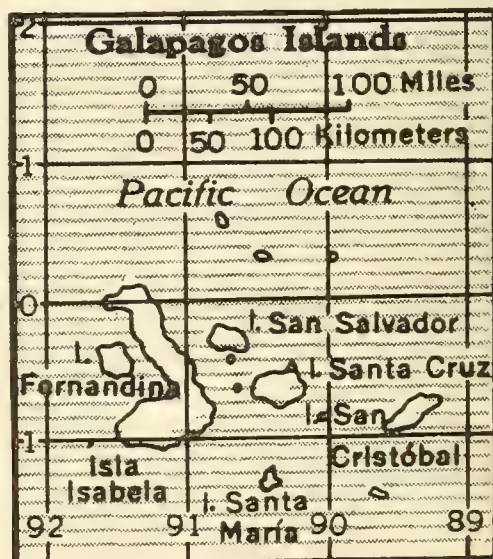
Note: See Commercial Fisheries Review, March 1965 p. 73.



Ecuador

FISHERY TRENDS IN GALAPAGOS ISLANDS, 1963:

The 1963 fishery catch of Ecuador's Galapagos Islands was estimated to be 550 metric tons. Spiny lobster, sea bass, and mullet



Ecuador (Contd.):

were the most important species, although small quantities of shark and tuna were also landed. Virtually all of the catch is processed, with frozen lobster tails, salted and dried sea bass, and mullet the principal processed products.

The Galapagos Islands' fishing fleet consists of 64 vessels, all but 6 of which are motorized. Included in the total are 3 vessels serving as a base of operations for lobster fishing, and 1 refrigerated transport vessel of 268 gross tons, which carries fish between the Galapagos and Guayaquil.



El Salvador

SHRIMP INDUSTRY TRENDS, 1964:

Summary: During 1964, El Salvador's shrimp fleet landed a total of 7.6 million pounds of shrimp--down only slightly from the previous year, but about 10 percent below 1961's record high. The 1964 shrimp exports of 7.2 million pounds were exceeded only in the record year of 1961. Due to lower prices, however, the total value of shrimp exports in 1964 declined to US\$4.2 million, a drop of about 9 percent from 1963. Almost all of El Salvador's shrimp exports went to the United States. It is estimated that 339,000 pounds of shrimp were consumed domestically in El Salvador in 1964.

Landings: White shrimp of large size (20 shrimp and less per pound) made up about



half of the 1964 shrimp landings. The quantity of white shrimp landed in El Salvador during the last 4 years has been fairly constant.

The other major item in the catch was sea bob.

The catch of pink and brown shrimp has been declining steadily. The brown shrimp catch in 1964 was only one-fourth that of 1961; pink shrimp landings in 1964 were down about 50 percent from 1961.

The total catch of other shellfish (mainly spiny lobster) and miscellaneous fish landed by the shrimp fleet has been growing about 10 percent annually, and reached 3.1 million pounds in 1964. The shrimp vessels probably still discard part of their fish catch at sea for lack of a ready market.

An increasing fishing effort is being required per unit of catch. During 1964, El

El Salvador Shrimp Industry: Landings, Exports, and Fishing Effort, 1958-1964

Item	Unit	1964	1963	1962	1961	1960	1959	1958
Shrimp Landings: ^{1/}								
White	1,000 lbs.	3,851	3,632	3,485	3,856	4,458	1,846	1,179
Pink	" "	831	1,054	1,212	1,652	2,243	11	0
Brown	" "	228	205	254	960	433	1	0
Total shrimp, other than sea bob	" "	4,910	4,891	4,951	6,468	7,134	1,858	1,179
Sea bob	" "	2,715	2,820	3,310	2,037	663	64	116
Total shrimp landings	" "	7,625	7,711	8,261	8,505	7,797	1,922	1,295
Other Fisheries Landings	" "	3,090	2,594	2,013	1,729	1,351	854	1,132
Shrimp Exports: ^{1/}								
Quantity ^{2/}	" "	7,247	6,842	7,156	8,113	6,700	1,838	1,131
Value ^{2/}	US\$1,000	4,227	4,668	5,150	5,505	4,216	1,298	660
Shrimp Fishing Effort:								
Average number of vessels equipped for fishing	Number	67	64	65	63	53	16	14
Total vessel fishing days of fleet	Days	19,000	18,000	16,000	15,000	12,000	3,000	2,000

^{1/}Headless shrimp.

^{2/}Preliminary.

Source: Fisheries Section, El Salvador, Ministry of Economy.

San Salvador (Contd.):

Salvador's shrimp fleet logged 19,000 fishing days with an average of 67 vessels engaged in fishing. In 1963, almost the same catch was taken by 64 vessels fishing only 18,000 days.

Fishing Industry: Since 1962, the Government of El Salvador has restricted the country's shrimp fleet to 73 vessels.

There are now only three shrimp-freezing and packing plants in the country. The largest of the present firms freezing and packing shrimp operated 58 boats during 1964, and landed about 80 percent of El Salvador's total shrimp catch. That firm's freezing and packing facilities are located at Puerto El Triunfo. The firm is adding new machinery and expects to begin producing the higher-priced peeled and deveined shrimp for export in 1965. Another shrimp company located at Puerto El Triunfo operated 16 vessels in 1964. The third company operated only four vessels in 1964. Its plant is located at La Union on the Gulf of Fonseca.

Exports, Consumption and Stocks: A total of 7,247,000 lbs. of shrimp valued at \$4,227,000 was exported in 1964. Those exports yielded the Government of El Salvador 1,085,000 colones (\$434,000) from the export tax of 6 U. S. cents a pound. Domestic shrimp sales (mainly sea bob) totaled about 339,000 pounds. The difference of 39,000 pounds between production and the total of exports and domestic consumption presumably remained as year-end stocks. The greater portion of El Salvador's shrimp exports go to the United States, by trailer truck to the Caribbean coast of Guatemala, then by freighter to Miami, Fla.

Outlook: The present white shrimp fishery in Salvadoran water seems capable of supporting a catch of around 4 million pounds annually on a sustained yield basis. In view of the foreign exchange to be earned from shrimp exports, it would appear desirable to increase the catch of brown and pink shrimp. "Royal-red" shrimp are also probably available in Salvadoran waters, but they are not now harvested in any appreciable quantity. It is hoped that the United Nation's Special Fund \$1.5 million 6-year technical assistance program to the Central American fishing industry will provide additional information on brown, pink, and royal-red shrimp stocks in

Salvadoran waters. (United States Embassy, San Salvador, April 22, 1965.)

Note: See Commercial Fisheries Review, Dec. 1964 p. 91 and Feb. 1962 p. 64.



German Federal Republic

FISH MEAL AND OIL INDUSTRY TRENDS FOR 1964 AND OUTLOOK FOR 1965:

Fish Meal: West German imports and consumption of fish meal reached new highs in 1964. (Editor's Note: West German fish meal imports in 1964 totaled 391,900 metric tons as compared with only 295,300 tons in 1963, according to Oil World Weekly. The International Association of Fish Meal Manufacturers has reported West German domestic production of fish meal in 1964 as 73,900 tons, or only 16 percent of the total supply.)

The increase in West German fish meal imports was due mainly to larger shipments from Peru (the leading supplier), Chile, Angola, and South Africa Republic.

The increase in West German consumption of fish meal was due mainly to increased pork and egg production and improved feeding practices. Those factors will also be effective during 1965, but the increases will probably be smaller than last year.

Fish meal price increases in the first part of 1965 are due partly to Soviet purchases on the world market, according to trade sources in the West German industry. They believe Soviet purchases will continue, but West German fish meal consumption will probably hold fairly steady even if prices increase somewhat over current levels.

Fish Oil: West German fish oil imports totaled 65,743 tons in 1964 and 65,105 tons in 1963. The leading suppliers were Peru (with 32,349 tons in 1964 and 31,627 tons in 1963) and the United States (with 17,263 tons in 1964 and 11,371 tons in 1963). West German exports of fish oil in 1964 totaled 12,681 tons, down 30 percent from the 17,992 tons shipped in 1963.

Whale Oil: West German imports of whale oil totaled 51,233 metric tons in 1964 compared with 66,188 tons in 1963. Japan was the leading supplier with 34,029 tons in 1964

German Federal Republic (Contd.):

and 42,249 tons in 1963, followed by Norway with 5,133 tons in 1964 and 11,515 tons in 1963. West German exports of whale oil totaled only 168 tons in 1964 and 441 tons in 1963. (United States Embassy, Bonn, April 1, 1965.)



Greece

FISHERIES TRENDS, 1964:

Greece's total catch of fish in 1964 was estimated at 105,000 metric tons (up 2 percent from 1963) valued at US\$34.7 million (up 5 percent). Greek coastal waters yielded about 67,000 tons in 1964 (down 3 percent); the Mediterranean yielded 7,500 tons (down 18 percent) and Greek lakes and breeding stations yielded 9,500 tons (up 58 percent).

The 1964 Greek catch in the Atlantic increased by 13 percent over 1963, reaching a total of 21,039 tons valued at about \$7 million. The number of Greek freezer trawlers in the Atlantic fleet increased to 29 vessels in 1964 with a combined tonnage of 17,990 tons. The average yield per freezer trawler was 935 tons in 1964, continuing the small but steady downward trend of recent years.



Fishing vessels at Pireaus, Greece, fishing port for the City of Athens.

Recent legislation by the Greek Parliament classifies high-seas fishing catches as "industrial products" and so authorizes the imposition of an antidumping tariff against imports from other countries when dumping is proven.

To reopen important African fishing and sponge grounds to Greek vessels, the Greek Government has signed a fishing agreement with Libya and Mauritania, and Greek negotiations are planned with Tunisia.

Production of sponges in 1964 from Greek and foreign waters totaled 80.9 tons valued at \$1,154,000, about the same as in 1963. In addition, 8.9 tons of coral valued at about \$148,000 were harvested in 1964.

The experimental breeding of trout at the Government's hatchery on the Louros river has proven highly successful. Some 25 percent of the fry laid in March 1963 grew into marketable fish in only 8 months. About 5 tons of hatchery trout were sold in 1964. The average yield per square meter of basin has been 10 kilograms (22 pounds) of trout annually. One small Greek private firm is now engaged in trout breeding, and Government officials believe that more firms could profitably enter this field. (United States Embassy, Athens, February 5, 1965.)

Note: See Commercial Fisheries Review, Jan. 1965 p. 80; June 1964 p. 40; May 1964 p. 51.



Iceland

HERRING EX-VESSEL PRICES SET FOR MARCH 1-JUNE 15, 1965:

Minimum ex-vessel prices for south and west coast herring during March 1-June 15, 1965, were set by the Icelandic Fishing Industries Price Committee as follows:

Herring for freezing, salting and filleting--Kr. 1.56 a kilo (1.64 U. S. cents a pound).

Herring for reduction, unsorted--Kr. 1.40 a kilo (1.47 U. S. cents a pound).

Herring for animal feed--Kr. 1.00 a kilo (1.05 U. S. cents a pound).

The price of reduction herring is more than double the reduction price of Kr. 0.67 a kilo (0.71 U. S. cents a pound) in effect March 1-June 15, 1964. (United States Embassy, Reykjavik, March 30, 1965.)

Note: Icelandic Kr. 43.06 equal US\$1.00.

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Iceland (Contd.):

EXPORTS OF FISHERY
PRODUCTS, 1963-64:

During 1964, there was a considerable increase in exports of frozen fish fillets, cod-liver oil, fish meal, and herring meal as compared with 1963, according to the Statistical Bureau of Iceland's Statistical Bulletin, Feb-

Product	1964			1963		
	Qty.	Value f.o.b.		Qty.	Value f.o.b.	
		Metric Tons	1,000 US\$		Metric Tons	1,000 US\$
Salted fish, dried	1,138	28,154	653	2,420	53,958	1,252
Salted fish, uncured	23,955	371,321	8,615	18,990	239,321	5,552
Salted fish fillets	1,428	21,839	507	1,114	14,346	333
Wings, salted	1,173	14,765	343	1,529	18,793	436
Stockfish	11,580	337,403	7,828	9,616	278,656	6,465
Herring on ice	392	1,104	26	7,311	23,610	548
Other fish on ice	34,512	215,039	4,989	36,161	202,066	4,688
Herring frozen	21,891	129,918	3,014	37,384	208,497	4,837
Other frozen fish, whole	4,814	53,050	1,231	3,952	41,102	954
Frozen fish fillets	54,095	1,096,264	26,433	47,903	895,954	20,786
Shrimp and lobster, frozen	1,171	109,926	2,550	1,138	96,823	2,246
Roes, frozen	1,703	27,900	647	860	14,869	345
Canned fish	381	20,067	466	340	16,310	378
Cod-liver oil	9,815	91,717	2,128	8,650	66,094	1,533
Lumpfish roes, salted	419	10,609	246	324	5,322	123
Other roes for food, salted	2,371	43,939	1,018	3,180	44,961	1,044
Roes for bait, salted	3,049	25,286	588	1,745	12,571	292
Herring, salted	46,223	517,085	11,996	57,282	552,053	12,808
Herring oil	52,403	417,619	9,689	55,148	301,357	6,991
Ocean perch oil	28	188	4	754	5,130	119
Whale oil	4,499	37,582	872	3,444	24,482	568
Fish meal	26,738	166,368	3,860	22,809	119,689	2,777
Herring meal	96,379	594,803	13,799	76,583	439,661	10,200
Ocean perch meal	2,265	13,239	307	4,028	18,667	433
Wastes of fish, frozen	7,156	22,867	533	4,779	13,181	306
Liver meal	575	3,827	89	442	3,036	70
Lobster and shrimp meal	156	686	16	267	693	16
Whale meal	1,387	7,698	179	100	558	13
Whale meat, frozen	2,277	18,167	421	2,447	17,138	398

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.

ruary 1965. Exports of herring on ice, frozen herring, salted herring, and herring oil showed a decrease in 1964.

EXPORT STOCKS OF PRINCIPAL
FISHERY PRODUCTS, FEBRUARY 28, 1965:

Iceland's stocks of frozen groundfish (fillets) for export to the United States totaled

Item	Quantity			Value	
	Metric Tons	Million Kr.	US\$ 1,000		
Groundfish, frozen:					
For export to:					
U. S.	2,157	47.5	1,103.1		
Other countries	1,386	24.0	557.4		
Stockfish	4,030	112.8	2,619.6		
Herring:					
Salted	2/	16.3	378.5		
Frozen	3/5,572	33.0	766.4		
Industrial products:					
Fish meal:					
Herring	5,381	35.5	824.4		
Other fish	4,526	18.7	434.2		
Herring oil	26,347	218.7	5,079.0		

^{1/}Includes only stocks intended for export.

^{2/}Not available.

^{3/}Includes 313 tons of frozen herring fillets valued at Kr. 3.0 million (US\$69,670).

Note: Icelandic kronur 43.06 equals US\$1.00

2,157 metric tons as of February 28, 1965 (see table). (United States Embassy, Reykjavik, March 26, 1965.)

United States imports of frozen groundfish fillets from Iceland in the year 1964 totaled 17,812 metric tons of groundfish blocks and slabs, 4,669 metric tons of cod fillets, 2,791 metric tons of haddock fillets, and 548 metric tons of ocean perch fillets.

EXPORTS OF FISH OIL
AND MEAL, 1962-1964:

Iceland's exports of fish and fish-liver oils in 1964 totaled 62,246 metric tons, 4 percent below the previous year's tonnage. Exports of fish meal increased 21 percent to 125,957 tons in 1964, the largest volume on record.

Item	1964	1963	1962
. . . . (Metric Tons)			
Oil:			
Herring	52,403	55,184	60,478
Ocean perch	28	754	15
Cod-liver	9,815	8,650	5,312
Total fish and fish-liver oil	62,246	64,588	65,805
Meal:			
Herring	96,379	76,583	48,489
Ocean perch	2,265	4,028	437
Other fish	26,738	22,809	20,230
Fish-liver	575	442	320
Total meal	125,957	103,862	69,476

Herring meal shipments accounted for most of the increase. (Statistical Bulletin of Iceland, Vol. 34, No. 1, February 1965.)

FISHERY LANDINGS BY PRINCIPAL
SPECIES, JANUARY-OCTOBER 1964:

Species	Jan.-Oct.		Jan.-Sept.	
	1964	1963	1964	1963
. . . . (Metric Tons)				
Cod	270,469	218,655	265,638	214,701
Haddock	48,992	42,470	42,703	38,738
Saithe	20,216	13,117	18,894	11,946
Ling	4,302	5,035	3,879	4,804
Wolfish (catfish)	8,159	16,952	8,110	12,839
Cusk	2,962	5,179	2,846	5,013
Ocean perch	25,174	29,911	23,063	28,059
Halibut	1,019	1,025	926	914
Herring	501,350	370,832	441,488	362,597
Shrimp	348	512	202	349
Capelin	8,640	1,077	8,640	1,077
Lobster	2,626	4,874	2,612	4,806
Other	9,827	6,909	8,497	6,360
Total	904,084	716,548	827,498	692,203

Note: Except for herring which are landed round, all fish are drawn weight.

Iceland (Contd.):

UTILIZATION OF FISHERY LANDINGS,
JANUARY-OCTOBER 1964:

How Utilized	Jan. -Oct.		Jan. -Sept.	
	1964	1963	1964	1963
..... (Metric Tons)				
Herring^{1/} for:				
Canning	218	296	93	296
Oil and meal ..	427,497	267,338	376,811	264,388
Freezing	20,437	26,342	14,604	22,285
Salting	53,198	71,240	49,980	70,012
Fresh on ice	-	5,617	-	5,617
Groundfish^{2/} for:				
Fresh on ice	31,671	29,663	27,514	24,796
Freezing and fillets	173,935	155,955	165,728	147,604
Salting	87,768	69,662	85,727	69,109
Stockfish (dried unsalted)	82,067	68,530	81,435	67,685
Canning	24	35	24	35
Oil and meal ..	3,455	3,186	3,094	2,977
Capelin for:				
Freezing	133	188	133	188
Oil and meal ..	8,507	889	8,507	889
Shrimp for:				
Freezing	190	399	166	267
Canning	159	113	36	82
Lobster for:				
Fresh on ice	-	2	-	2
Freezing	2,626	4,872	2,612	4,804
Home consumption	12,199	12,221	11,034	11,167
Total production	904,084	716,548	827,498	692,203
^{1/} Whole fish.				
^{2/} Drawn fish.				



India

JOINT FISHING VENTURES AND
SHRIMP TRADE WITH JAPAN PROPOSED:

Indian trade representatives on April 10, 1965, were reported to have approached the Japanese Overseas Fishery Cooperative Association (a Government-sponsored organization) with offers to establish various types of joint fishing ventures in India with major Japanese fishing firms. The proposals were taken for study by the Association. One large Japanese fishing company has been operating a joint trawl fishery with Indian interests for over 10 years.

The Indian representatives are also said to be seeking to export to Japan shrimp which reportedly are being taken in increasing quantity off Cochín. (Shin Suisan Shimbun Sokuho, April 13, 1965.)



Japan

PROGRESS ON NEGOTIATIONS ON
CANNED TUNA IN BRINE EXPORTS TO U. S.:

Japanese canned tuna in brine exports to the United States have been suspended since December 1964 as a result of the failure of the Japanese tuna packers and exporters to conclude an "Exporters Agreement." However, developments in late March indicated that the dispute might be settled shortly.

On March 15, 1965, the Exporters Association submitted to the Ministry of International Trade and Industry (MITI) an agreement calling for a 20-percent adjustment quota (for packers' use). This agreement differed with the memorandum exchanged between the packers and exporters which called for a 30-percent adjustment quota, and the packers were quick to point this out. The problem was later resolved by the Exporters Association's submission to MITI of a memorandum stating that the packers would have sole allocation rights over the 30-percent adjustment quota, thereby removing the packers' objection to the new agreement.

On March 29, MITI promulgated the ministerial trade control ordinance applicable to all Japanese canned tuna in brine exports from April 1, and on March 30 announced the "Standard for Approval of Canned Tuna Exports to the United States" by which the Government will approve a total of 2.3 million cases of canned tuna in brine for export during the period April 1-November 30, 1965. However, as of the end of March, a slight uncertainty continued to persist among some packers inasmuch as MITI and the Ministry of Agriculture and Forestry, the two government agencies concerned with canned tuna exports, had not exchanged any note concerning the method of determining the allocation of the adjustment quota.

Reportedly, the prolonged suspension of canned tuna exports to the United States has reduced Japanese canned tuna in brine holdings in the United States to an extremely low level. According to a report filed by the Japan Export Trade Promotion Organization representative stationed in New York in March, holdings in the United States of Japanese 7-ounce whitemeat solid pack had hit bottom and the supply of 4-pound lightmeat solid pack had been completely exhausted. (Suisancho Nippo, April 1; Suisan Tsushin, March 31; Suisan Keizai Shimbun April 1; Nihon Suisan Shimbun, March 29, 1965.)

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Japan (Contd.):

ALBACORE TUNA FISHING CONDITIONS
OFF JAPAN AND FROZEN TUNA
EXPORT PRICE TRENDS:

Albacore tuna fishing off the Japanese islands commenced two weeks later than usual this year due to cold water conditions. But fishing picked up considerably in early April. A total of 160 metric tons were landed at Yaizu on April 6, 1965. About 50 pole-and-line vessels were fishing albacore. Japanese tuna packers were offering 120-135 yen per kilogram (US\$302-340 a short ton) for the pole-caught fish.



A Japanese tuna long-liner.

In mid-April, frozen tuna from Japan proper for export to the United States was quoted (price a short ton, c. & f.): round albacore--around \$365; yellowfin (gilled and gutted) \$355-360.

A Japanese trading firm contracted for the delivery of 800 short tons of Indian Ocean albacore for export to the United States at c.i.f. \$365 a short ton. (Suisan Keizai Shimbun, April 10; Suisancho Nippo, April 9, 1965, and other sources.)

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ATLANTIC TUNA FISHERY AND
PRICE TRENDS, MARCH 1965:

A total of around 150 Japanese tuna vessels was reported operating in the Atlantic Ocean in late March 1965. Of that number, about 120 were concentrated in the yellowfin and big-eyed tuna fishing grounds north of the Equator nearby the Cape Verde Islands and about 30 fishing for albacore tuna south of the Equator. However, albacore catches were reported falling off.

Exports of frozen dressed yellowfin to Italy as of late March were US\$420-425 a

metric ton, c.i.f., down \$15 per ton from early March prices. The market was turning soft due to high canned tuna inventories being carried by Italian packers. Frozen dressed big-eyed shipments in Italy were US\$280 a metric ton, c.i.f.

Japanese exporters, in late March, were shipping most of their albacore to Spain following issuance of an export permit of 3,000 metric tons to that country. Initially, albacore shipped to Spain brought US\$400 a metric ton, c.i.f., but later declined to \$380 a ton. However, those prices were \$15-25 a ton higher than the prices for albacore shipped to the United States. Reportedly, Japanese-caught Atlantic albacore for export to the United States were offered at \$275 a short ton, f.o.b. West African port, but U. S. packers were showing little buying interest at that price. (Suisan Tsushin, April 2 & 3, 1965, and other sources.)

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LARGER VESSELS TO OPERATE
FROM OVERSEAS TUNA BASES:

Under a new regulation by the Japanese Fisheries Agency, effective April 1, 1965, the size limit on tuna fishing vessels operating out of South Pacific tuna bases was raised from 180 gross tons to 240 gross tons, or the same as the tonnage limit for catcher vessels engaged in the tuna mothership operations. At the same time, the Agency simplified administrative procedures for vessels wishing to fish out of established overseas bases and for vessels seeking to unload catches at overseas bases under certain conditions. (Suisan Tsushin, March 27, 1965.)

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TUNA PURSE-SEINE FLEET OFF
WEST AFRICA REPORTS POOR FISHING:

A Japanese fishing company's 2-boat tuna purse-seine fleet (led by the 1,600-ton refrigerated mothership Chichibu Maru No. 2), which has been operating off West Africa since early November 1964, reports poor fishing. As of early April, the fleet caught less than 1,000 metric tons of tuna, predominantly skipjack and scarcely any yellowfin. The skipjack were smaller than those found off the coast of Japan, averaging under two kilograms (4.4 pounds) per fish.

During the early stages of the West African operation, the skipjack were observed to be escaping the net by diving under it. This

Japan (Contd.):

was corrected by modifying the net, making it sink faster, and by speeding up the pursuing operation. However, the skipjack schools recently encountered by the fleet are reported to be skittish, making it difficult to completely surround them before they escape. As many as 7 or 8 schools are sighted per day, but the schools are reported to be small when compared to those found off the Japanese coast. (Shin Suisan Shimbun Sokuho, April 6, 1965.)

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TUNA LONG-LINE FISHERY MANAGEMENT:

The Japanese Fisheries Agency has released a report, "Research and Analysis of Distant-Water Tuna Long-Line Fishery Management," prepared by Assistant Professor Akira Nakai of the Kochi Junior College. The report, which is based on a study of the tuna long-line vessel operators in Muroto City, Kochi Prefecture, points out the need to re-appraise Japan-based independent tuna fishing operations. It ascribes the deteriorating economic position of the tuna fishery to the following factors: (1) reduced net income resulting from high operating costs; (2) depreciation of new vessels; (3) declining value of production of old, inefficient vessels; (4) rising rates of interest on loans extended to owners of large vessels and bad debts resulting from advance payment of wages to crew members by small vessel owners; and (5) excessive capital investments with borrowed money, resulting in overburdening the one-family one-vessel type of fishery operators. (Suisan Keizai Shimbun, April 9, 1965.)

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TUNA EXPORTERS UNHAPPY OVER YUGOSLAVIAN GRADING SYSTEM:

The grading system (based on yield) adopted by Yugoslavia since January 1965 for imported frozen tuna has resulted in claims being pressed against the Japanese trading firms handling exports to that country. The firms are not happy over this development and the Japan Frozen Foods Exporters Association is looking into the problem. Some exporters have suggested that tuna exports to Yugoslavia should be temporarily ended for a month or two if Yugoslavia does not abolish the grading system. (Suisancho Nippo, April 7, 1965.)

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GOVERNMENT CONSIDERING FORMING SPECIAL TUNA STUDY GROUP:

The Japanese Fisheries Agency is considering establishing a special study group composed of industry and government officials to study the problems confronting the Japanese tuna fishery. Formation of the study group had been requested by the National Federation of Tuna Fishermen's Cooperative Associations, which has for some months been studying ways and means of overcoming the depressed conditions facing tuna vessel operators. (Suisan Keizai Shimbun, April 10, 1965.)

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MODERN TUNA PURSE SEINER BEING CONSTRUCTED:

A modern 212-ton Japanese purse seiner, Taikei Maru (equipped with two power blocks), was constructed in a shipyard in northern Japan. It is reported that the purse seiner is the first Japanese fishing vessel to be equipped with two power blocks and is, in addition, equipped with a brine-freezing system and the latest communication equipment, including facsimile and ultrahigh-frequency radio. The vessel was scheduled for completion in early May 1965.

The first Japanese purse seiner to employ a power block for net hauling was the Kenyo Maru (240 gross tons) in the summer of 1962. Reportedly, the adoption of the hydraulic power block reduced manpower requirements on that vessel from 30 to 17. (Shin Suisan Shimbun Sokuho, April 7, 1965.)

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NORTH PACIFIC SALMON CATCH QUOTA ALLOCATION FOR 1965:

On April 8, the Japanese Fisheries Agency announced salmon catch quota allocations for the 1965 Western Pacific season as follows (with 1964 comparisons):

	1965	1964
	. . . (Metric Tons) . . .	
<u>Area A</u> (north of 45° N. latitude):		
Mothership-type fishery	45,478	44,665
Land-based gill-net fishery . . .	10,522	10,335
Subtotal	56,000	55,000
<u>Area B</u> (south of 45° N. latitude):		
Land-based gill-net fishery . .	35,300	33,240
Land-based long-line fishery . .	15,700	14,760
Pacific coastal fishery (Hokkaido)	4,500	4,000
Japan gill-net fishery	3,500	3,000
Subtotal	59,000	55,000
Grand total	115,000	110,000
Source: <u>Suisan Keizai Shimbun</u> , April 10, 1965.		

Japan (Contd.):

Note: Agreement on a 1965 Japanese salmon catch quota of 115,000 metric tons in the western Pacific (off the coasts of Japan and the U.S.S.R.) was reached March 31, 1965, at the ninth annual meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.). It provided for 56,000 tons in Area A (an increase of 1,000 tons from 1964) and 59,000 tons in Area B (an increase of 4,000 tons).

Note: See Commercial Fisheries Review, July 1964 p. 62.

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KING CRAB PRODUCTION
AND PRICE TRENDS:

A possible shortage of export king crab packed in $\frac{1}{4}$ -pound cans is reported in Japan. In view of this situation, Japanese trading firms are said to be asking packers that at least one-third of the pack which they consign to the Crab Sales Company be of the $\frac{1}{4}$ -pound size. In fiscal year 1964 (April 1964-March 1965), canned king crab consigned to the Sales Company totaled 363,000 cases, including 62,000 cases of the $\frac{1}{4}$ -pound pack. King crab offered by the Sales Company currently is quoted at US\$28.15 a case for $\frac{1}{2}$ -pound 48's and \$16.90 a case for $\frac{1}{4}$ -pound 48's. (Suisan Tsushin, April 8, 1965.)

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KING CRAB FLEETS DEPART
FOR OKHOTSK SEA:

The four Japanese king crab factoryships (Yoko Maru, 5,763 gross tons; Kaiyo Maru, 5,549 gross tons; Hakuyo Maru, 6,430 gross tons; and Seiyo Maru, 6,404 gross tons) departed Hakodate for the Okhotsk Sea crab

grounds on April 7, 1965. Their production quota is 60,000 cases (48 $\frac{1}{2}$ -lb. cans) per fleet, a total of 240,000 cases. (Kanzume Nippo, April 12, 1965.)



Fig. 2 - Processing crab meat aboard a Japanese crab factoryship.

Note: On March 24 agreement on the 1965 king crab quotas was reached for waters in the Sea of Okhotsk and the Bering Sea off Kamchatka by Japan and the U.S.S.R. at the ninth annual meeting of the Northwest Pacific Fisheries Commission. Japan's quota is 240,000 cases (48 $\frac{1}{2}$ -lb. cans), a reduction of 12,000 cases from the previous year. The Soviet quota is 420,000 cases, or 42,000 cases more than in 1964.

Note: See Commercial Fisheries Review, May 1965 p. 53; Aug. 1964 p. 72; July 1964 p. 42.

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FISHING VESSEL OPERATIONS
IN BERING SEA:

The Japanese 7,482-ton shrimp factoryship Einin Maru, accompanied by a fleet of 15 catcher vessels, was scheduled to depart for the eastern Bering Sea on April 14, 1965. The factoryship is scheduled to remain on the fishing grounds until September 20. Her production target is 180,000 cases (48 $\frac{1}{2}$ -lb. cans) of shrimp and 1,000 tons of frozen products.



Fig. 1 - Japanese shrimp factoryship Einin Maru.



Fig. 1 - After deck of Japanese crab factoryship showing crab cookers (extreme right) and crew mending nets (center).

Japan (Contd.):

The combined total 1965 shrimp production target of the Japanese factoryships operating in the eastern Bering Sea is 390,000 cases (48 $\frac{1}{2}$ -lb. cans).



Fig. 2 - Japanese factoryship Tenyo Maru.

The 11,581-ton factoryship Tenyo Maru, accompanied by 10 catcher vessels, was scheduled to depart for the eastern Bering Sea on April 20. The factoryship is to fish mainly for Alaska pollock for conversion into minced fish. Minced fish meat made from Alaska pollock is used as an ingredient for fish cake and fish sausage. At present, there are 34 plants in northern Hokkaido (annual production capacity of 30,000 metric tons) engaged in the production of minced Alaska pollock meat. Their 1965 production target is 26,000 tons. (Suisan Tsushin, April 7, 1965.)

The 700-ton factoryship Kotoshiro Maru No. 15 departed Hachinohe, northern Japan, for the eastern Bering Sea on April 8.

The 10,357-ton fish meal factoryship Gyokuei Maru departed Hakodate, Hokkaido, for the eastern Bering Sea on April 9. (Suisancho Nippo, April 10, 1965.)

Note: See Commercial Fisheries Review, Mar. 1965 p. 81; Feb. 1965 p. 68.

BERING SEA FISH MEAL PRODUCTION TARGET FOR 1965:

Seven Japanese factoryships operating in the eastern Bering Sea will be engaged in the production of fish meal this year. They are: Gyokuei Maru (10,357 gross tons); Hoyo Maru (14,000 gross tons); Soyo Maru (11,192 gross

tons); Shikishima Maru (10,144 gross tons); Itsukushima Maru (5,889 gross tons); Tenyo Maru No. 3 (3,700 gross tons); and the Tenyo Maru (11,581 gross tons). Their combined production target is 41,000 metric tons of fish meal. Of the seven fleets, only Gyokuei Maru and the Hoyo Maru will be engaged on a full-time basis in meal production. In 1964, Japanese factoryships operating in the Bering Sea produced a total of 45,500 metric tons of meal. (Suisancho Nippo, April 8, 1965.)

Note: See Commercial Fisheries Review, Dec. 1964 p. 101; June 1964 p. 48, Mar. 1964 p. 60.

FISH MEAL MARKET TRENDS:

The production of 5,600 metric tons of fish meal produced by the 14,000-ton Japanese fish-meal factoryship Hoyo Maru has been sold on the Japanese domestic market for 63,750 yen (US\$177) a ton. In 1964 factoryship-produced fish meal sold for 60,500 yen (\$168) a ton; in 1963 for 62,500 yen (\$174).

The meal produced by the Hoyo Maru, which operated in the Okhotsk Sea, was processed from 36,300 metric tons of Alaska pollock supplied to the factoryship in February-March 1965 by Russian trawlers. The agreement establishing the joint enterprise extends for another two years. (Suisancho Nippo, April 9, 1965, and other sources.)

Note: See Commercial Fisheries Review, May 1965 p. 76; Mar. 1965 p. 83.

FISH MEAL IMPORTS, FY 1965:

The Japanese Fisheries Agency on April 1 formally approved the importation of 148,000 metric tons of fish meal for Fiscal Year 1965 (April 1965-March 1966). This represents a substantial increase of 42,000 tons over FY 1964 imports, which totaled 106,000 tons. (Suisan Keizai Shimbun, April 3, 1965.)

MACKEREL FISHING AND CANNING TRENDS:

As of March 31, 1965, the mackerel canners of the Choshi District (Chiba Prefecture, Japan) had packed 520,000 cases of mackerel, of which 100,000 cases were for export. This was a substantial reduction in pack as compared to the same period a year ago when they packed 630,000 cases, of which 185,000 cases were for export. Fishing prospects in

Japan (Contd.):

mid-April were reported poor due to a cold-water mass extending from off Choshi to Katsuura to the south. A considerable quantity of seine-caught mackerel was landed on April 9; the price ex-vessel was 22-23 yen a kilogram (US\$55-58 a short ton), but due to their very small size and high price, the canners did not buy the fish. (Kanzume Nippo, April 8 & 10, 1965.)

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CANNED JACK MACKEREL PRICES:

The Japan Export Canned Sardine and Mackerel Sales Company has announced the following prices for canned jack mackerel:

Japanese Can Size	Equivalent U. S. Can Size	Price Per Case	
		Yen	US\$
In tomato sauce:			
No. 1 oval 24's	1-lb. oval 24's	1,075	2.99
No. 3 oval 48's	1-lb. oval 48's	1,200	3.33
No. 1 small 100's	5-oz. tall 100's	1,870	5.19
No. 4 48's	1-lb. tall 48's	1,900	5.28
No. 6 48's	-	1,075	2.99
Natural:			
No. 3 oval 48's	1-lb. oval 48's	1,150	3.19
No. 1 small 100's	5-oz. tall 100's	1,700	4.72
No. 4 48's	1-lb. tall 48's	1,700	4.72
Source: Suisan Tsushin, March 30, 1965.			

Source: Suisan Tsushin, March 30, 1965.

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JAPANESE FIRM TO EXPERIMENT
WITH BRINE-FREEZING SYSTEM
ABOARD FISHING VESSELS:

A large Japanese fishing company plans to install a brine-freezing system (described as the "Okabe system") in the 99-ton vessel Asahi Maru on an experimental basis in fall

1965. If successful, the firm plans to gradually adopt it on other tuna vessels.

The "Okabe system" employs two 3-ton capacity freezing wells. Fish are dropped into one well through a chute and chilled in heavy brine solution at -22°C . (-7.6°F .) for 8 hours. The brine is then drained into the second well, after which the frozen fish are removed and stored in a nearby hold. The "Okabe system" reportedly will result in considerable saving of time and labor, eliminating the need for full-time refrigeration attendants inasmuch as regular deck hands can be used in their place. On a 500-ton vessel, this system reportedly will reduce manpower requirements by 5 men. The cost of the two brine wells is reported to be approximately 2 million yen (US\$5,556). (Shin Suisan Shim-bun Sokuho, March 27, 1965.)

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EXPORTS OF FROZEN RAINBOW TROUT,
JANUARY-FEBRUARY 1965 AND YEAR 1964:

The United States and the United Kingdom are the principal world markets for frozen rainbow trout exported from Japan. In January 1965, Japan's total exports of frozen rainbow trout amounted to 138 short tons valued at US\$105,122, of which 54 percent in quantity and 56 percent in value were exported to the United States and 26 percent in quantity and 22 percent in value to the United Kingdom.

Although Japan's exports of frozen rainbow trout to all countries in January 1965 increased 18 percent in quantity and 3 percent in value from those in January 1964, purchases by the United States were down 13 percent in quantity and lower by 24 percent in

Japan's Exports of Frozen Rainbow Trout by Country of Destination, January 1965 with Comparisons

Destination by Country	February 1965		February 1964		Jan. 1965		Jan. 1964		Jan.-Dec. 1964	
	Short Tons	Value US\$	Short Tons	Value US\$	Short Tons	Value US\$	Short Tons	Value US\$	Short Tons	Value US\$
United States	62	49,900	118	105,111	75	58,953	86	77,219	1,408	1,119,099
United Kingdom	46	30,861	35	26,444	36	23,967	19	14,506	418	285,288
Netherlands	-	-	-	-	5	3,719	-	-	-	-
Belgium	23	19,692	-	-	15	13,072	-	-	-	-
Canada	15	13,089	-	-	3	2,219	-	-	-	-
South Africa	-	-	-	-	2	1,203	-	-	-	-
Australia	5	4,508	-	-	2	1,989	-	-	-	-
Hong Kong	1	839	-	-	-	-	-	-	-	-
Sweden	3	2,100	-	-	-	-	-	-	-	-
West Germany	1	792	-	-	-	-	-	-	-	-
Italy	2	316	-	-	-	-	-	-	-	-
Other	-	-	34	26,967	-	-	12	10,725	340	278,889
Total	158	122,097	187	158,522	138	105,122	117	102,450	2,166	1,683,276

Note: Not shown separately for some countries prior to 1965.

Source: Japan Bureau of Customs.

Japan (Contd.):

value. Exports to the United Kingdom in January 1965 were up 88 percent in quantity and 65 percent in value as compared with the same month a year earlier.

Japan's exports of frozen rainbow trout in February 1965 of 158 short tons valued at US\$121,997, increased 15 percent in quantity and 16 percent in value as compared with exports in the previous month. Exports to the United Kingdom increased 28 percent in quantity and 29 percent in value from January to February 1965. The February exports of that product to Belgium and Canada were higher than in January. Although shipments to the United States in February dropped 17 percent and 15 percent in quantity and value, respectively, it remained the principal buyer of Japanese rainbow trout. (Fisheries Attache, United States Embassy, Tokyo, March 29 and April 2, 1965.)

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AIRCRAFT TO BE USED FOR FISH SPOTTING AND HYDROGRAPHIC OBSERVATIONS:

The Japan North Pacific Region Surrounding Net Council, which has been conducting aerial surveys of sea conditions off the northeastern coast of Japan for the past 11 years, plans to expand the area of investigation by employing a larger aircraft, the Cessna 182. The aircraft will be equipped with a special radiation water temperature meter (to be purchased from the United States) which will enable the taking of sea surface temperature measurements directly from the plane. In addition, the Cessna 182 will be used to conduct other hydrographic studies, such as current movements, and to search for fish concentrations. Data collected by the aircraft will be radioed to a relay station for transmission to fishing vessels via facsimile. (Suisan Keizai Shimbun, March 27, 1965.)

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FISHERY LABOR CONDITIONS IN JAPAN:

The Japanese Fisheries Agency has compiled a report, "Survey of Fishery Labor Conditions in 1964"; it was prepared with a view toward contributing to the improvement in fishery labor. It discusses labor, employment, and wage conditions in the fishing industry. Based on a survey of 608 management units in 8 types of medium and small

fisheries in 19 prefectures, some facts uncovered by the survey are: (1) wage structure even within the same type of fishery varies with managements and with locality (crew members in many regions receive base pay plus a share of the catch, but none works under a straight wage system); (2) monthly wages of those who made the most in 1963 were down but higher for those who were in lower income categories; and (3) recruitment of young workers is becoming an acute problem, as indicated by the fact that 84 percent of the fishery enterprises surveyed were experiencing varying degrees of difficulties in hiring young men. (Suisan Keizai Shimbun, April 9, 1965.)

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FISHERIES RESEARCH PROGRAMS BEING CONSOLIDATED:

The Japanese Fisheries Agency is reorganizing and consolidating the research programs of the Agency's regional laboratories. Tuna research presently conducted by the Nankai Regional Laboratory in southern Japan, bottomfish studies conducted by the Tokai Laboratory in Tokyo, fur seal research carried out by the Tohoku Laboratory in northern Japan, and salmon research conducted by the regional laboratory in Hokkaido are being consolidated and will be conducted out of a new distant-water fisheries research laboratory now under construction in Shimizu, Shizuoka Prefecture, and scheduled for completion within the current fiscal year ending March 1966. Salmon research will continue to be conducted at the Hokkaido Laboratory but the program will organizationally be classified under distant-water research. (Suisan Tsushin, April 6, 1965, and other sources.)



Mexico

FISH CANNING CENTER AT ENSENADA EXPANDS:

The greater part of the canned fish production in Mexico originates in the Ensenada area of Baja California. The demand for canned fish in Mexico is growing rapidly, and canning capacity at Ensenada is being expanded.

A Mexico City firm has built a new modern anchovy canning plant just south of Ensenada. The new cannery first operated in August 1964 with a pack of 6,000 cases. When production

Mexico (Contd.):

is resumed this summer the new cannery is expected to produce an annual pack of 200,000 to 300,000 cases (100 4.5-oz. cans) of anchovy ("sardines") in tomato sauce or cottonseed oil. The new cannery should employ 250 persons during the anticipated 4-month season. Like other Ensenada canneries, the new cannery will market its entire production in Mexico.



Fig. 1 - General view of fishing vessels and boats in the harbor at Ensenada, Baja California.

Plant equipment at the new cannery is of United States and Swedish manufacture. The firm plans to add reduction machinery to make fish meal and oil from the waste.

Adjacent to the new cannery, a larger plant is being built by another firm to pack anchovies as well as fruit and vegetables.



Fig. 2 - Purse seiners unloading sardines and mackerel at dock in Ensenada. Suction pumps are on floating barge between vessels. Belt conveyors carry fish to trucks for delivery to cannery. Vessel in foreground is brine-refrigerated.

In the same area is a new can manufacturing plant which will produce about 7 million sardine cans a year, all of which will be taken, at present, by one of the established canneries at Ensenada. Can-making equipment is of United States, German, and Spanish manufacture. Tinplate blanks are from the United States.



Fig. 3 - DUKW or amphibious "duck" delivering mackerel to cannery in Ensenada. Purse seiners lie at anchor in harbor, unload fish into the "duck," and it runs on the beach and along the streets to the canneries. The three smaller canneries in Ensenada receive their fish deliveries in this way.



Fig. 4 - Two canneries in Ensenada that pack mackerel and sardines.



Fig. 5 - Large cannery located about 5 miles out of Ensenada. Cans sardines, mackerel, tuna, and also tomato products.

Addition of the two new packing plants to the several already operating will solidify Ensenada's position as Mexico's leading seafood canning center. (United States Embassy, Mexico, D. F., April 3, 1965, from information supplied by Consulate General, Tijuana.)



Morocco

FISH PROTEIN CONCENTRATE FOR HUMAN CONSUMPTION:

Fish protein concentrate or fish flour is to be produced on a commercial scale in Morocco at a plant being built at Agadir by the National Society of Comestible Flour from Fish (SONAFAP). The project is a joint enterprise of private capital and the Moroccan Government.

The new factory is expected to use 50 metric tons of fresh sardines a day and produce 300 to 400 tons of concentrate during the 220 days of the fishing season in the region of Agadir. The plant will employ about 200 seasonal and 20 permanent employees. The production of the plant could be quickly doubled with a small additional investment, according to reports.

Morocco may provide an interesting test as to whether fish protein concentrate can be marketed in a tradition-oriented society. (United States Embassy, Rabat, March 10, 1965.)



Mozambique

FISHERIES ENTERPRISE BEING DEVELOPED BY PORTUGUESE-SOUTH AFRICAN GROUP MAY HELP MODERNIZE FISHING INDUSTRY:

A freezing and canning plant to handle shrimp and possibly other fishery products is being established at Porto Amelia in northern Mozambique by a firm representing interests in Portugal and the South Africa Republic.

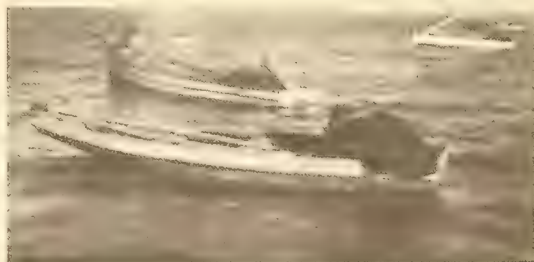
The group is also sponsoring fisheries exploration--mainly for shrimp--off the east coast of Africa. The explorations were started in late 1964 and are being conducted by two trawlers supplied under an arrangement with a French firm. (The same French firm may also furnish marketing and other technical assistance.) Early in March 1965, one of the exploratory trawlers reported a shrimp catch of 800 kilos (1,764 pounds) in 4 hours.

The new enterprise may help modernize Mozambique's fishing industry which in 1962 had only 92 motor-powered vessels in its fishing fleet of 7,965 small fishing craft. Land-

ings in Mozambique in 1962 totaled only 3,256 metric tons consisting of 2,429 tons of fish, 409 tons of shrimp, 160 tons of cockles, and 258 tons of other fishery items. To supplement the domestic catch, Mozambique imports about US\$2.1 million worth of dried fish annually from Portugal and a small amount of frozen fish from South Africa.



In early 1965, a representative of the Portuguese-South African group said the Porto Amelia plant should be ready in early summer 1965 to begin processing frozen shrimp for



Typical fish boats still used at Lourenço Marques.

Mozambique (Contd.):

marketing in the United States and South Africa. Although the plant will concentrate on shrimp initially, it has been designed to handle up to 70 tons of varied fish landings a day, according to reports. Investment in the project was thought to have reached \$1 million by early 1965.

The Portuguese-South African group may establish a number of other plants on the Mozambique coast to process fishery products (such as shrimp, lobster, crab, tuna, bonito, and pilchard).

Freezing and cold-storage plants with capacities up to 100,000 tons have also been mentioned in their plans. Although the group is primarily interested in exports, such facilities would also aid domestic fish marketing in Mozambique.

In early 1965, the fishing fleet of the Portuguese-South African group included two vessels purchased from Angolan firms and a South African motor launch, in addition to the two vessels chartered from the French firm. The vessels ranged from 48 to 67 feet in length. Several more vessels have been ordered by the group which has plans for a fishing fleet of up to 29 vessels. The group also has an airplane which can be used for fish spotting. (Regional Fisheries Attache for Africa, United States Embassy, Abidjan, March 22, 1965, and United States Consul, Lourenco Marques, April 6, 1965.)



New Zealand

TUNA FISHERY DEVELOPMENT PROGRAM INITIATED:

The Government of New Zealand earlier this year approved plans of the Fishing Industry Board for experimental work in the development of tuna fishing in New Zealand offshore waters. A subcommittee of the Board, consisting of an equal number of members from the Fishing Industry Board and the New Zealand Marine Department is responsible for the operation of this experimental project and has already done much to implement its plans.

An official statement issued jointly by New Zealand's Minister of Marine and the Chair-

man of the Fishing Industry Board said, "The first stage of a combined Marine Department and Fishing Industry Board tuna development project commenced in the first week of February (1965) in the Gisborne/Tauranga area.

"The objective of the 4 to 6 weeks' experimental tuna fishing program is to compare the effectiveness and economics of different methods of tuna fishing under commercial conditions. The four methods to be used are monofilament gill-netting, live-bait pole fishing, long-lining, and possibly purse-seining.

"Planning for the project is in the hands of a joint committee set up by the board, comprising representatives of the Marine Department and the Fishing Industry Board."

It was hoped at the time the statement was issued that an experienced live-bait pole fisherman would be brought to New Zealand from Australia to run the pole-fishing vessel so that New Zealand skippers and crews who had training during Japanese fishing demonstrations would run the vessels using the other three methods under direct supervision of Japanese experts.

The official statement added, "It is planned to use aircraft for tuna spotting and use will be made of modern electronic fish-finding equipment. Tuna is known to exist in New Zealand waters and February is normally a good month for sightings in the proposed experimental fishing area."

The joint project between the industry and the New Zealand Marine Department is expected to be a forerunner for future coordinated efforts to develop New Zealand's fishing resources.

If the project shows that tuna can be taken economically in commercial quantities, further active steps will be taken by the Board and the Marine Department to develop tuna fishing as an important aspect of New Zealand's fishing industry. (New Zealand Commercial Fishing, February 1965.)

Note: See Commercial Fisheries Review, October 1964 p. 73.

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FIFTY YEARS OF WHALING COMES TO AN END:

New Zealand whaling came to an end in 1964 when its last whaling station closed down after half a century of operations. The reason: economics.

New Zealand (Contd.):

New Zealand whalers had traditionally hunted the humpback whale and in 1960 caught 226--an all-time record. But in 1961 the catch dropped to 55 and in 1962 to only 27.

With the collapse of humpback whaling, one of the two New Zealand whaling companies closed down. But the other firm decided to hunt sperm whales, never before exploited by New Zealanders. They were successful at first and in 1963 took 201 sperm whales with the aid of spotting aircraft and modern techniques.

But success was short-lived. Not only did competition from Soviet whalers develop off New Zealand, but world demand for whale oil fell and prices dropped. Despite Government guarantees to cover operating costs, the New Zealand station found it could no longer make a profit and closed down. (Foreign Trade, Canadian Department of Trade and Commerce.)

Note: See Commercial Fisheries Review, Sept. 1964 p. 85.



Nicaragua

SHRIMP FISHERY TRENDS:

Shrimp are caught on both the Pacific and Caribbean coasts of Nicaragua, with landings in 1962 totaling an estimated 3.5 million pounds. Although about half the catch is from the Pacific area, the Caribbean fishery is growing more rapidly.

The large shrimp-processing plant at El Bluff in southeastern Nicaragua, which is operated by a United States firm, is working at capacity and is planning to expand. The plant facilities are modern, clean, and efficient. Most of the output consists of peeled and de-veined, individually frozen pink shrimp counting 20-30 to the pound; "broken" shrimp are bulk-packed and frozen. The plant has a large storage capacity for holding shrimp until they can be shipped to the United States. The present fleet, which is owned by the United States firm and is to be enlarged, consists of 38 vessels, mostly old vessels from Gulf of Mexico ports. An additional 12 vessels are fishing for a nearby plant at La Nica. A total of 70 fishing vessels is reported to be operating in the area.

A large canoe fishery is conducted in the bay at El Bluff. The canoes, some of which are motorized, carry a crew of 2 or 3 men, using cast nets. A buyer selects the best quality large shrimp from the canoe landings for resale to the processing plant and the remainder is sold in the local market or in Managua.

Note: See Commercial Fisheries Review, January 1964 p. 65.



Norway

PRELIMINARY REPORT ON EXPORTS OF CANNED FISH IN 1964:

Exports of all the principal Norwegian canned fishery products during January 1-November 28, 1964, were larger than in the same period of 1963. Exports of canned brisling showed the greatest increase.

Norwegian Exports of Principal Canned Fishery Products		
Product	1/Nov. 28, 1964	Nov. 23, 1963
	. . . (Metric Tons). . .	
Brisling	5,843	4,837
Small sild	13,421	12,930
Kippered herring	3,049	2,818
Soft herring roe	1,112	684
Sild delicatessen	554	476
Shellfish	1,555	1,435
1/Preliminary.		

The packing of sild sardines in 1964 started in early May and by December 26, 1964, a total of 872,057 standard cases of small sild had been packed, compared with 970,000 cases in the same period of 1963. Most of that pack was smoked sild. (Unsmoked sild accounted for only 56,519 cases of the 1964 pack and 64,262 cases of the 1963 pack.) As of December 26, the 1964 exports of canned sild sardines totaled 875,315 standard cases as compared with 911,645 cases in the same period of 1963.

As usual, the brisling canning season closed October 15. The 1964 brisling pack totaled 378,719 standard cases, compared with 282,160 cases in 1963. The 1964 brisling pack would have been even larger if additional supplies had been available. According to preliminary data, Norwegian exports of canned brisling in 1964 totaled 412,474 standard cases as compared with 305,695 cases in 1963. One factor behind the increase

Norway (Contd.):

in exports was the advertising allocation of Kr. 2.5 (35 U.S. cents) per standard case of brisling set aside by Norwegian canners in 1964.

The Norwegian pack of canned kippered herring in 1964 totaled 213,000 cases, an increase of 55,000 cases from 1963 but a decline of 156,695 cases from 1962.

Norwegian production of canned crab and canned anchovies showed a small increase in 1964, while the output of canned shrimp and sild delicatessen showed some decline in 1964.

For January to October 1964, Norwegian total canned fishery exports of 25,645 tons were valued at Kr. 128.8 million (US\$18.0 million), compared with 23,024 tons valued at Kr. 116 million (\$16.2 million) in the same period of 1963.

The United States was the main market for Norwegian exports of canned fishery products in January-October 1964 with 8,354 tons valued at Kr. 45 million (\$6.3 million), followed by the United Kingdom with 6,444 tons valued at Kr. 35 million (\$4.9 million). Other markets were the South Africa Republic with 1,525 tons, Australia with 1,519 tons, Czechoslovakia with 1,089 tons, and Canada with 744 tons.

With the exception of sales to the United States, canned fish deliveries to all major markets in January-October 1964 were running ahead of the same period in 1963. Shipments to the United Kingdom were up 1,408 tons and Kr. 9 million (\$1.2 million). The decline in shipments to the United States was 1,355 tons in quantity and Kr. 5.9 million (\$824,000) in value. The decline in exports to the United States was due mainly to smaller shipments of canned brisling in oil and canned sild in oil.

Although exports of canned fishery products increased in 1964, Norwegian canners report that profit margins have been reduced as a result of rising costs for wages and raw material. Competition abroad is said to be tightening, particularly in countries with lower production costs.

Norwegian canners are also concerned about the outlook for sales to the European

Common Market, which is designed to give intra-Community trade a preference over shipments from outside countries such as Norway.

On the other hand, Norwegian exports benefit from tariff reduction in the European Free Trade Association (EFTA). Part of the increase in exports to the United Kingdom was due to the fact that canned brisling ordered in 1963 was shipped early in 1964 to benefit from EFTA year-end tariff cuts. (Norwegian Canners Export Journal, February 1965.)

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FISHERIES LANDINGS, 1962-1964:

Norwegian fisheries landings in 1964 totaled 1.4 million metric tons with an ex-vessel value of Kr. 777 million (US\$109 million), up 19 percent in quantity and 11 percent in value from 1963. Sharply higher landings of winter herring and trawl herring accounted for most of the increase. Those gains more than offset a considerable decline in landings of fat herring, small herring, and cod.



Norwegian vessels fishing for cod on the Lofoten fishing grounds. Photo taken in 1950.

A heavy run of herring off the Lofoten area of northern Norway contributed to the striking recovery of the winter herring fishery. The sharp fluctuations in Norwegian fisheries reflect the country's heavy dependence on coastal fisheries.

The cod fishery off northern Norway has declined steadily in recent years and the trend continued in 1964. The capelin (smelt) fishery continued at a relatively low level. (Capelin landings totaled over 200,000 tons in 1961, but the fishery was almost wiped out in 1962 when capelin failed to seek Norwegian waters.) Landings were also down in 1964 for haddock, Norway pout, and dogfish. On the other hand, landings were up substantially for saithe and mackerel.

Norway (Contd.):

Norwegian Fisheries Landings, 1962-1964									
Species	1/1964			1963			1962		
	Quantity	Value		Quantity	Value		Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000	Metric Tons	Kr. 1,000	US\$1,000
Fish:									
Herring:									
Winter	286,254	69,849	9,755	61,509	25,169	3,515	84,068	32,115	4,485
Fat	56,576	16,100	2,249	143,813	43,648	6,096	171,267	45,202	6,313
Small	106,113	24,579	3,433	172,787	35,598	4,972	136,165	31,844	4,447
Fjord	1,016	857	120	1,321	1,096	153	2,701	2,282	319
Trawl	186,132	63,397	8,854	32,419	12,548	1,752	12,510	4,851	678
Iceland	91,620	38,122	5,324	98,133	40,830	5,702	152,199	59,000	8,240
Sprat	10,174	9,737	1,360	16,602	10,495	1,466	10,596	11,542	1,612
Total herring . .	737,885	222,641	31,095	526,584	169,384	23,656	569,506	186,836	26,094
Cod:									
Spawning	47,276	53,192	7,429	58,255	60,514	8,452	68,270	65,867	9,199
Finmark	19,329	21,209	2,962	35,495	32,002	4,470	31,218	26,126	3,649
Other	93,801	107,806	15,057	97,790	103,209	14,415	100,789	95,218	13,299
Total cod	160,406	182,207	25,448	191,540	195,725	27,337	200,277	187,211	26,147
Capelin (smelt) . .	19,625	2,734	382	28,338	2,181	305	363	62	9
Salmon and sea trout	1,600	20,000	2,793	1,553	19,320	2,698	1,671	21,511	3,004
Halibut ²	3,594	14,623	2,042	3,794	15,422	2,154	4,687	16,569	2,314
Cusk	19,641	20,352	2,842	17,505	16,012	2,236	16,726	14,043	1,961
Haddock	34,695	34,528	4,822	46,412	40,811	5,700	41,694	34,980	4,885
Norway pout	93,337	16,697	2,332	106,482	18,637	2,603	40,751	7,138	997
Saithe	143,562	78,120	10,910	107,627	62,829	8,775	83,165	44,689	6,241
Ling ³	13,125	20,145	2,814	10,924	13,573	1,896	10,556	11,833	1,653
Mackerel	47,712	22,741	3,176	24,114	16,739	2,338	16,955	13,282	1,855
Tuna	1,137	2,700	377	130	303	42	6,794	13,486	1,883
Dogfish	25,343	15,704	2,193	30,810	16,089	2,247	28,682	14,026	1,959
Porbeagle	5,264	18,186	2,540	4,554	13,670	1,909	1,771	5,302	741
Other fish ⁴	57,314	38,832	5,423	45,296	30,594	4,273	45,324	27,047	3,778
Total fish	1,364,240	710,210	99,189	1,145,663	631,289	88,169	1,068,922	598,015	83,521
Fish livers & roe . .	17,917	9,826	1,372	18,651	8,888	1,241	20,607	10,245	1,431
Shellfish:									
Shrimp	11,047	44,438	6,206	11,729	46,169	6,448	10,908	42,619	5,952
Lobster	376	7,502	1,048	502	8,725	1,219	555	8,516	1,189
Crab	3,943	2,689	376	3,593	2,750	384	3,557	2,623	366
Squid	1,500	450	63	860	226	32	6,018	1,981	277
Total shellfish . .	16,866	55,079	7,693	16,684	57,870	8,083	21,038	55,739	7,784
Seaweed, dried . . .	12,000	2,200	307	8,668	1,620	226	13,405	3,254	454
Total landings . .	1,411,023	777,315	108,561	1,189,666	699,667	97,719	1,123,972	667,253	93,190
¹ /Preliminary. ² /Does not include the lower-valued "Greenland halibut." ³ /Does not include "blue ling." ⁴ /Mostly "Greenland halibut," "blue ling," plaice, pollock, ocean perch, wolffish, eel, and sand eel. Note: Norwegian kroner 7.16 equal US\$1.00. Source: <u>Norwegian Fishing and Maritime News</u> , No. 4, 1965.									

In 1964, Norwegian shellfish landings--mainly shrimp, lobster, and crab--continued at the rather modest level of past years.

Note: See Commercial Fisheries Review, May 1963 p. 79.

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ANTARCTIC WHALE OIL PRODUCTION, 1964/65:

At the conclusion of the 1964/65 Antarctic whaling season, Norway's 4 expeditions had processed a total of 232,500 barrels of whale and sperm oil (38,750 tons), as against 252,740 barrels (42,143 tons) during the preceding

season. (A decade ago in 1955, Norway had 10 Antarctic expeditions which produced 852,000 barrels of oil.) Whale oil production dropped to about 175,000 barrels (29,166 tons), as compared to approximately 202,500 barrels in the 1963/64 season. The production of sperm oil rose from 50,273 to 57,460 barrels (9,576 tons).

The output of the Norwegian expeditions in 1964/65 was very uneven. Two of the expeditions actually surpassed their production in 1963/64, but the other two expeditions lagged far behind.

Norway (Contd.):

During the 1964/65 Antarctic season, the Norwegian catch consisted mainly of sei whales. Fin whale stocks appear to be rapidly diminishing, while blue whales are virtually extinct.

The value of the oil processed by the Norwegian expeditions during the 1964/65 Antarctic season is estimated at about 60 million kroner (US\$8.4 million), which includes Kr. 50 million (\$7.0 million) for whale oil and Kr. 10 million (\$1.4 million) for sperm oil. The possible value to Norwegian expeditions of other byproducts of 1964/65 whaling (meat, meal, and meat extract) was estimated at Kr. 90 million (\$12.6 million) by the newspaper Tønsberg Blad.

The 4 Norwegian expeditions had a total complement of 1,857 officers and men when they set off for the Antarctic last fall. As recently as the 1958/59 season, 6,817 Norwegians manned whaling ships. (News of Norway, April 22, 1965.)

Note: See Commercial Fisheries Review, April 1964 p. 68.

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SUPPLY AND DISPOSITION OF MARINE OILS, 1964 WITH COMPARISONS:

Norway's production of marine oils in 1964 consisted mainly of herring oil (80,000 metric tons) and fish-liver oil (10,000 tons), plus Antarctic sperm oil (8,546 tons) and whale oil (34,419 tons).

Item	1964 ^{1/}	1963 ^{2/}	1962
	(Metric Tons)		
Cold-cleared cod-liver oil	10,000	4,100	5,500
Other fish-liver oils		6,100	1,000
Herring oil	80,000	55,000	61,000
Total fish and fish-liver oils	90,000	65,200	67,500
Seal oil	2,500	2,000	2,800
Sperm oil:			
Antarctic	8,546	7,378	12,020
Shore stations (Norway)	363	916	687
Total sperm oil	8,909	8,294	12,707
Whale oil:			
Antarctic	34,419	31,423	85,015
Shore stations (Norway)	262	209	847
Total whale oil	34,681	31,632	85,862
Total marine oils	136,090	107,126	168,869
^{1/} Preliminary.			
^{2/} Revised.			

Herring oil production in 1964 was up 45 percent from the previous year due mainly to

sharply higher landings of winter herring and North Sea trawl herring. It is estimated that the Norwegian fish meal and oil industry absorbed over 75 percent of Norwegian herring landings in 1962-1964. (Norwegian herring meal production was up 41 percent in 1964.) The 1965 outlook for the Norwegian herring reduction industry is promising since the year began with an excellent winter herring catch.

Norwegian production of Antarctic whale and sperm oil in 1964 showed some increase over the previous year, but 1964 output was down sharply from that of 1962, and the outlook for 1965 is for even lower production since Norway failed to meet its catch quota during the 1964/65 Antarctic season.

	1/1964	2/1963	1962
	. . . . . (Metric Tons)		
Supply:			
Stocks, January 1	60,129	71,336	54,163
Production:			
Whale oil	34,681	31,423	85,864
Herring oil	80,000	55,000	61,000
Total production	114,681	86,423	146,864
Imports:			
Whale oil	2,100	11,715	1,674
Herring oil	75,430	53,278	51,858
Total imports	77,530	64,993	53,532
Total supply	252,340	222,752	254,559
Disposition:			
Exports:			
Whale oil	16,150	25,631	65,948
Herring oil	810	98	125
Total exports	16,960	25,729	66,073
Processed by hardening industry ^{3/}	150,166	136,894	117,150
Stocks, December 31	85,214	60,129	71,336
^{1/} Preliminary.			
^{2/} Revised.			
^{3/} The data are arrived at by deducting year-end stocks and exports from total supply; the export figures are complete but the year-end stocks may include oil not included in the production figures.			

The Norwegian supply of marine oils in 1964 was increased not only by higher domestic production but also by much larger imports of herring oil. The gain was only partly offset by lower whale oil imports. Since marine oil exports from Norway declined in 1964, it is assumed that much of the increased supplies went to the domestic hardening and refining industry. Carryover stocks were also up on December 31, 1964.

Norwegian imports of all types of marine oil (mainly herring oil) in 1964 totaled 85,474 tons valued at 118.1 million kroner (US\$16.5

Norway (Contd.):

million). The leading supplier was Iceland with 44,189 tons valued at Kr. 62.3 million (\$8.7 million), followed by the United States with 14,119 tons valued at Kr. 19.2 million (\$2.7 million), and West Germany with 10,594 tons valued at Kr. 13.7 million (\$1.9 million).

Norwegian exports of all types of marine oils in 1964 totaled 47,367 tons valued at Kr. 75.9 million (\$10.6 million). The leading buyer was the United Kingdom with 10,696 tons, followed by West Germany with 6,175 tons, the Netherlands with 5,851 tons, and the United States with 4,998 tons. (Foreign Agricultural Service, United States Embassy, Copenhagen, March 22, 1965.)

Note: See Commercial Fisheries Review, July 1964 p. 71.

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GOVERNMENT-INDUSTRY FISHERIES AGREEMENT AIMS TO ELIMINATE PRICE SUBSIDIES BY 1968:

In Norway, a General Agreement on State support and other measures to increase fishermen's income was concluded between the Ministry of Fisheries and the Fishermen's Association (Norges Fiskarlag) on June 3, 1964, and approved by the Norwegian Parliament on January 12, 1965.

The General Agreement, which aims at making the Norwegian fishing industry independent of price subsidies by 1968, contains the following main provisions:

1. Negotiations on subsidies and other support measures for the fishing industry will take place between the Ministry of Fisheries and the Fishermen's Association, the latter acting as the sole representative of the fishermen.

2. The Fishermen's Association may request negotiations for support measures when the profitability "under normal fishing conditions" for "averagely well operated and well equipped vessels" engaged in fishing on a full-time basis is not in "reasonable proportion" to the incomes in other jobs. Negotiations may also be requested for temporary support measures when the difficulties are due to "structural factors."

3. The main emphasis should be on support measures which can make fishing, production, and marketing more effective and

promote rational development generally in the industry.

4. Government funds shall be allocated for special loans to qualified fishermen who want to acquire vessels suitable for the coastal fishing banks and for offshore fishing.

5. The State Fisheries Bank should have sufficient resources available for short-term credit for modernization of the fishing fleet.

6. With regard to social measures, the negotiations should aim at allocation of a portion of total State support for the industry to a social fund to cover part of the premium payments for social security.

7. Price subsidies will be gradually eliminated by the end of 1968, provided other development measures result in a reasonable increase in fishermen's income. (United States Embassy, Oslo, February 15, 1965.)

(Editor's Note: Of interest--in view of the Norwegian proposals--is the position on fishing industry subsidies adopted at the June 1964 meeting of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD). The Fisheries Committee of OECD made a distinction between justifiable subsidies and those which should be eliminated.

According to a statement issued July 21, 1964, by the Council of OECD, justifiable subsidies include those which "may be necessary for developing the fishing industry and raising its productivity or for facilitating the alternative employment of fishermen."

On the other hand, OECD condemned "catch premiums and subsidies given to fishermen on the basis of the quantity of fish landed, gross proceeds, or time spent at sea." Referring to that class of subsidies, OECD said: "Such schemes should only be introduced by way of exception and for a period not exceeding 3 years. In those countries where such subsidies have been made for more than 5 years, the aim should be to reduce them gradually with the object of abolishing them within 10 years." OECD recommended the eventual total abolition of such subsidies because they have too great an influence on foreign trade.)

Note: See Commercial Fisheries Review, April 1965 p. 80, and Oct. 1964 p. 48.



Peru

FISH MEAL OUTPUT CONTINUES HEAVY IN SPITE OF FISHING UNCERTAINTIES IN MARCH 1965:

Peruvian fishing turned erratic in March 1965 when warm water moved into the normally cold anchoveta fishing grounds. However, Peruvian output of fish meal exceeded 94,000 metric tons during the first half of March. Despite high production in early March, prices remained firm to strong. In early April 1965, Peruvian fish meal for May delivery was quoted at US\$128 f.o.b. Peruvian ports. Prices for delivery later in the year were reported to be well above that level with very little offered.



A typical anchoveta boat about ready for launching at Callao in 1962.

The warm water pushing into the anchoveta grounds is driving fish deeper and also closer toward shore. This shoreward concentration of fish may have helped the fishermen, but they have also had to go deeper to get their catches. Birds which depend on anchoveta for food cannot get at the fish as easily. Anticipating a reduction in guano output, fertilizer producers have called for reduced fishing pressure.

Whether the intrusion of warm water will have any dramatic effect on fish meal production is still uncertain. Scientists at the Peruvian Marine Institute are watching developments closely. (United States Embassy, Lima, April 8, 1965.)

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FISH MEAL PRODUCTION TRENDS AND OUTLOOK, EARLY 1965:

In spite of a 3-week fishermen's strike at Chimbote in February 1965, Peruvian fish meal output in the first 2 months of 1965 was almost equal to the record production in the first 2 months of 1964. (Editor's Note: Pe-

ruvian fish meal production in January-February 1965 totaled 313,100 metric tons as compared with 320,600 tons in the same period of 1964, according to reports in Oil World Weekly, February 19 and March 12, 1965.) Without the strike, production in early 1965 would probably have run about 10 to 15 percent ahead of last year.

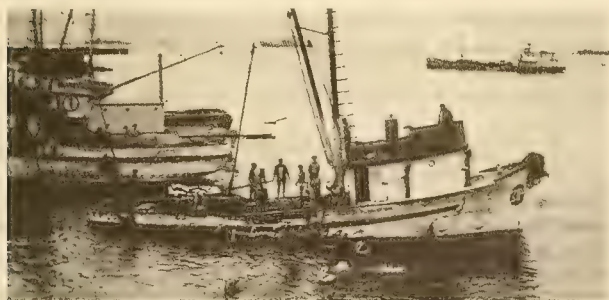


The 1965 production outlook is obscured by two factors. First, there is the possibility that heavy fishing pressure may have affected anchoveta spawning stocks. Second, there are unusual oceanographic factors such as the large body of warm water (known as a "nino") which is pushing its way southeastward into anchoveta grounds.

Scientists at the Peruvian Marine Institute will be better able to determine the effects of overfishing (if any) after the normal seasonal anchoveta catch decline in late May. The effects of the warm water moving in are more difficult to evaluate. For the present, the nino seems to have pushed the fish closer to shore where the water is cooler. The resultant concentration of anchoveta has, if anything,

Peru (Contd.):

improved fishing. Efforts are now under way to determine the extent of the nino, its source and direction of movement, and its future effect on fishing conditions.



Anchoveta boat waiting to unload at Chimbote.

Peruvian firms supplying machinery to the local fish meal industry are given excessive tariff protection, according to the Peruvian National Fisheries Society. This results in excessive costs and works a special burden, the Society alleges, on export producers who cannot pass the higher costs along in higher prices. Noting that the Peruvian Industrial Promotion Law under which special tariff increases are granted calls only for "adequate" protection, the fisheries organization has asked the Peruvian National Industrial Society for help in seeing to it that protection granted is consistent with the intent of the law. (United States Embassy, Lima, March 25, 1965.)

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FISH MEAL INDUSTRY TRENDS IN 1964 AND OUTLOOK FOR 1965:

Peruvian fisheries in 1964 were marked by a record catch of almost 9 million metric tons (mostly anchoveta), record fish meal production of over 1.5 million tons, and record fish meal exports of 1.4 million tons valued at US\$143 million. In spite of the tremendous gain in output, prices for fish meal remained firm throughout the year.

It is estimated that the Peruvian industry was working at only 65 percent of capacity while producing its record output in 1964.

A regional breakdown of Peruvian fish meal exports in 1964 shows Western Europe as the leading buyer with about 57 percent of the total, followed by North America with 22 percent, the Soviet Bloc with 9 percent, the Far East with 7 percent, and Latin America with

about 5 percent. As in the past, the three largest markets for Peruvian fish meal in 1964 were the United States, West Germany, and the Netherlands. Peruvian shipments to most foreign markets were up in 1964, and there was a sharp increase in shipments to West Germany, the United States, and the United Kingdom.

(Editor's Note: According to Oil World Weekly, Peruvian fish meal shipments to certain leading buyers in 1964 and 1963 were as follows:

	1964	1963
	.(1,000 Metric Tons).	
West Germany	308.2	203.8
United States	299.7	250.0
Netherlands	192.8	181.3
Japan	89.8	70.0
United Kingdom	83.7	49.2
Italy	82.4	62.9
France	50.1	46.3
Spain	38.0	76.4
Belgium	35.2	30.6
East Germany	41.2	42.6
Poland	27.2	9.8
Yugoslavia	23.4	31.0
Sweden	21.1	15.6
Mexico	35.9	27.8
Venezuela	20.4	5.9

Oil World Weekly reported Peruvian fish meal stocks at the end of 1964 as 260,500 tons; Peruvian fish meal production in January-February 1965 as 313,100 metric tons; and Peruvian fish meal exports in January-February 1965 as 294,900 tons.)

Outlook for 1965: In the Peruvian fish meal industry, price prospects are bullish while the production outlook is uncertain. Peruvian sellers reportedly slowed commitments in the spring of 1965 in order to build inventories for sale later in the year when production declines seasonally. Spot prices in the spring of 1965 were running upward from \$115 f.o.b. Peruvian ports. How far prices can rise without the threat of buyers turning to substitute sources is a subject of disagreement.

Informed observers estimate that Peruvian fish meal production in 1965 will fall somewhere between the 1963 and 1964 levels, that is between 1.1 and 1.5 million tons.

Scientists at the Peruvian Marine Institute have pieced together tentative indications that the intensity of fishing effort may be cutting into anchoveta spawning stocks. The effects of overfishing (if any) are expected to be much

Peru (Contd.):

clearer after the normal seasonal anchoveta catch decline in late May.

The effect of a large body of warm water moving into the anchoveta grounds is also uncertain. (United States Embassy, Lima, April 11, 1965.)



Poland

FISHERIES GOALS, 1965:

Landings: The Polish fisheries catch target in 1965 is 270,000 metric tons, up 47,000 tons from the target in 1964. Atlantic fisheries--with a 72-percent increase in catch goal--have the major responsibility for heavier landings. Increased catches are planned in the northwest Atlantic as well as off the African west coast. The Baltic Sea catch target was raised 8 percent, and the North Sea target was raised 7 percent (see table). Considerably heavier landings of ocean perch, cod, and North Sea herring are called for in 1965. Most of the overall increase in landings is to be achieved by State-owned fisheries.

Polish Fisheries Catch Goals, 1964-1965		
Item	1965	1964
. . . (Metric Tons) . . .		
Catch Goals by Fishing Areas:		
Atlantic area	81,000	47,000
Baltic Sea	98,000	91,000
North Sea	91,000	85,000
Total catch goal	270,000	223,000
Catch Goals by Fishing Groups:		
Private fisheries	16,000	16,000
Cooperative fisheries	27,000	23,000
State-owned fisheries	227,000	184,000
Catch Goals for Leading Species^{1/}:		
Cod	75,000	64,000
Ocean perch	29,000	12,300
Herring:		
North Sea	83,000	76,000
Baltic Sea	24,500	22,000
Sprat	16,500	14,000
Mackerel	2/	13,000
Flatfish	2/	4,700
Salmon and trout	400	275

^{1/}Does not include catch goals for all species.

^{2/}Not available.

Note: Data shown for both 1964 and 1965 are catch goals. Actual landings in 1964 are not yet available.

An important part of the State-owned fisheries catch goal of 227,000 tons in 1965 has been assigned to the reorganized "Dalmor" group. (At the start of 1965, two State-owned fishery enterprises, "Arka" and "Dalmor" of

Gdynia, were combined into one group known as "Dalmor." The new Dalmor group is to land a total of 97,600 tons of fish in 1965 from its overall fishing operations in the northwest Atlantic, North Sea, and Baltic Sea. Of that total, 52,900 tons are to be landed by factory trawlers, 27,100 tons by steam trawlers, and 17,600 tons by cutters. At the start of 1965, Dalmor's fishing fleet included 10 factory trawlers, 31 steam trawlers, and 52 cutters of 24 meters (78.7 feet).

Fishing Fleet: The increased landing goals in 1965 reflect the expansion of the Polish fishing fleet. Under current construction timetables, new vessels to be delivered to the State-owned fisheries in 1965 will include 4 "B-15-type" factory trawlers of 2,890 gross tons, 5 "B-18-type" freezer trawlers of 3,100 gross tons, 2 "B-23-type" freezer trawlers of 1,160 gross tons, and six 24-meter (78.7-foot) cutters. In working out the catch goals, it was assumed that the annual landings of a B-15 factory trawler would average 5,000 tons. Other expected annual landings by vessel class are: B-23 freezer trawler 2,400 tons, B-20 motor trawler 1,300 tons, steam trawler 900 tons, and 24-meter cutter 450 tons.

The cooperative fisheries expect to receive ten 17-meter (55.8-foot) and two 24-meter cutters in 1965.

Processing: Polish fish-processing facilities are also being called upon to expand output, particularly of fish meal. A total of 11,400 tons of fish meal is scheduled to be produced at sea and shore plants in 1965, compared with a target of 7,660 tons in 1964. Other production goals in 1965 are 2,100 tons of cod-liver oil, 23,000 tons of canned fish, 20,500 tons of smoked fish, 6,800 tons of pickled fish, and 2,900 tons of semicooked fish dishes.



Preparing herring for hot-smoking in a fishery plant in Gdynia.

Poland (Contd.):

Poland is scheduled to spend 200 million zloty (about US\$8.3 million) to modernize and expand fish-processing plants and harbors.

Exports: Planned exports in 1965 include 4,600 tons of canned fish, of which State-owned plants will supply about 3,800 tons and co-operatives 800 tons. Planned sales to West European markets include 400 tons of smoked fish and 1,750 tons of fresh and frozen fishery products (such as salmon, ocean perch, carp, eels, and shrimp). In addition, plans call for direct landings of about 9,000 tons of fish in West European and African ports during 1965.

Employment: The scheduled expansion in Polish fisheries should raise employment in the State-owned fisheries to 25,400 persons in 1965, an increase of about 1,200. (*Polish Maritime News*, January 1965 and February/March 1965.)

Note: See *Commercial Fisheries Review*, Nov. 1964 p. 107, and June 1964 p. 55.

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FISHERIES TRENDS, EARLY 1965:

Winter Fishing Activities: In the first part of February 1965, frequent and strong storms hindered fishing in the Baltic, but good catches were achieved by factory trawlers operating in the northwest Atlantic. Some of the daily Atlantic catches averaged about 50 metric tons of cod and ocean perch per unit.

During the winter months several Polish freezer-stern trawler and motor trawlers with freezing equipment fished off West Africa. Part of their catch was sold directly in African ports.

Polish trawlers from Szczecin took herring during the winter by means of midwater pair trawls in the North Sea and Skagerrak grounds.

Fisheries Research: The Sea Fisheries Institute of Gdynia has established a station at Kolobrzeg on the Baltic Sea. The new unit will study ways to modernize fishing gear and increase catches in the coastal region of the Baltic.

Aid to Foreign Fisheries: In early 1965, three Polish experts on inland fisheries left for Nigeria to spend several years as advisors on fish-breeding methods.

In mid-January, Polish fishermen sailed from Gdynia on board the *Traugutt* for India, where they will train Indian fishermen in operating trawls. A 17-meter (55.8 feet) fishing cutter for India was also shipped on board the vessel.

Danish Fishery Talks: In the second half of January, a delegation of Polish cooperative fisheries organizations visited Denmark and carried out talks with representatives of Danish fishery organizations on problems of interest to fishermen of both countries. It was resolved to carry out more meetings of this kind and undertake direct cooperation and exchange of information in the field of fishing and processing. (*Polish Maritime News*, February/March 1965.)

Note: See *Commercial Fisheries Review*, May 1965 p. 85.

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FISHERIES TRENDS, 1964:

Landings: Polish landings of salt water fish in 1964 amounted to about 244,400 metric tons, surpassing the overall catch goal for the year by 21,400 tons. The 1964 landings were also up considerably from the 210,000 tons landed in 1963 and 164,000 tons in 1962.

Table 1 - Polish Landings of Salt-Water Fish, 1964^{1/}

Species	Total	State-Owned Fisheries	Cooperatives	Private Fishermen
	(Metric Tons)			
Salmon . . .	355.9	2.0	265.1	88.8
Baltic eel . .	153.7	-	16.6	137.1
Baltic herring	18,844.2	11,673.2	5,176.4	1,994.6
North Sea herring . .	94,371.8	94,054.9	316.9	-
Sprat	17,693.4	12,141.7	2,262.9	3,288.8
Cod	53,563.5	38,269.5	9,896.6	5,397.4
Flatfish . . .	6,472.0	5,155.7	752.8	563.5
Mackerel . .	10,653.9	10,653.7	0.2	-
Ocean perch .	21,414.6	21,414.6	-	-
Other salt-water fish ^{2/}	18,116.3	17,823.7	104.5	188.1
Brackish-water fish .	2,745.5	-	3/2,566.6	178.9
Total . . .	244,384.8	211,189.0	21,358.6	11,837.2

^{1/}Preliminary.

^{2/}Includes catch off Africa.

^{3/}Includes 503.8 tons of eel.

The 1964 landings included 116,300 tons from the North Sea (31,300 tons over the catch goal for the area), 47,400 tons from the Atlantic (400 tons over the goal), and 80,700 tons from the Baltic Sea (10,300 tons under the goal).

A larger catch of North Sea herring accounted for most of the 1964 increase over the previous year. Landings were also up

Poland (Contd.):

for sprat, ocean perch, and mackerel, but landings were down for Baltic Sea herring.

The heavy catch of North Sea herring taken by Polish catchers was delivered not only to Polish bases and tender vessels but also to transshipment bases at the British port of North Shields, the Norwegian port of Hauge-sund, and the Belgian port of Ostende.

Fishing Fleet: Additions to the Polish fishing fleet in 1964 included 3 "B-15-type" factory trawlers of 2,890 gross tons, 7 "B-23-type" freezer trawlers of 1,160 gross tons, and 16 cutters. By the end of 1964, the Polish fleet included 10 factory trawlers, 10 freezer trawlers, 15 motor trawlers, 54 steam trawlers, 44 drifter-trawlers, 2 base ships, 1 tender ship, 568 cutters, and about 870 other boats and vessels.

Processed Fishery Products: With new factory trawlers and freezer trawlers entering service, Polish output of processed fishery products was up sharply in 1964. Frozen fish and fillets showed the largest increase (50,000 tons in 1964 as against only 23,400 tons in 1963).

Table 2 - Polish Production of Processed Fishery Products, 1960-1964

Products	1/1964	1963	1962	1960
	(1,000 Metric Tons)			
Frozen fish and fillets	50.0	23.4	21.5	22.4
Salted fish	61.5	54.6	45.6	58.7
Smoked fish	2/	18.5	17.7	16.0
Conserves ^{3/}	23.0	20.7	18.1	15.7
Marinades	2/	6.7	7.1	6.0
Cod-liver oil	2.2	1.9	1.4	1.1
Fish meal	9.5	7.0	4.8	3.3
Fish pulp	3.5	2.8	1.3	-

1/Preliminary.

2/Not available.

3/Includes hermetically-processed canned pack and cold-pack.

Imports: The rising demand for animal feed boosted Polish fish meal imports from

Table 3 - Polish Imports of Fishery Products, 1960-1964

Product	1/1964	1963	1962	1960
	(Metric Tons)			
Mackerel, frozen . .	1,450	568	500	-
Herring, fresh and frozen	5,583	3,891	5,992	4,014
Herring, salted . . .	6,490	8,517	5,132	19,681
Fish fillets	-	-	-	1,419
Conserves ^{2/}	2,069	1,328	2,670	6,141
Caviar	10	10	10	10
Fish meal	55,700	30,000	13,000	6,406
Total	71,302	44,314	27,304	37,671

1/Preliminary.

2/Includes hermetically-processed canned pack and cold-pack.

6,406 tons in 1960 to over 55,000 tons in 1964. During the same period, Polish imports of salted herring and canned fishery products declined as domestic fisheries expanded. Polish canned fish imports in 1964 consisted mainly of sardines in oil, a product which is not being produced by the domestic industry.

Exports: Polish exports of fishery products increased from 6,582 tons in 1960 to 11,162 tons in 1964. Almost half of the 1964 fishery exports consisted of direct landings of fresh and frozen fish in European and African ports. Most of the direct landings were sold in Ghana and Nigeria from "B-23-type" freezer trawlers and motor trawlers operating in the eastern Atlantic.

Table 4 - Polish Exports of Fishery Products, 1960-1964

Product	1/1964	1963	1962	1960
	(Metric Tons)			
Fresh and Frozen:				
Salmon	209	272	206	216
Other salt-water ^{2/}	5,559	4,270	405	-
Carp	478	380	379	546
Other fresh-water fish	925	892	933	852
Smoked fish	236	392	316	6
Salted fish	40	15	203	2,125
Conserves ^{3/}	3,695	3,414	3,733	2,807
Shellfish	20	32	36	30
Total	11,162	9,667	6,211	6,582

1/Preliminary

2/Direct landings in foreign countries.

3/Includes hermetically-processed canned pack and cold pack.

Polish exports included 3,695 tons of canned fish, of which 1,900 tons were sold to countries outside the Soviet Bloc. (*Polish Maritime News*, February/March 1965.)

Note: See *Commercial Fisheries Review*, June 1964 p. 55.



South Africa Republic

ANCHOVY EXPERIMENTAL FISHING CONTINUED OFF SOUTH-WEST AFRICA:

Experimental anchovy fishing off Walvis Bay in South-West Africa was resumed in mid-January 1965. Two vessels searched the area between Cape Cross north of Walvis Bay and Sandwich Harbour to the south, but without any early success.

Each pilchard factory at Walvis Bay has been licensed to use two anchovy nets for experimental fishing. Anchovy fishing off Walvis Bay during August, September, and October last year was not encouraging. Only 718 short tons of anchovy were caught off South-west Africa in 1964. On the other hand over

South Africa Republic (Contd.):

100,000 tons of anchovy were caught off the Cape West Coast of the South Africa Republic in 1964. (South African Shipping News and Fishing Industry Review, February 1965.)

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PELAGIC SHOAL CATCH, INDUSTRIAL PRODUCTION, AND CANNED FISH PACK, 1959-1964:

With a total catch in 1964 of 1,195,353 short tons of pilchard, maasbanker, mackerel, and anchovy, the South African pelagic shoal fish factories of the Cape, Walvis Bay, and Lüderitz had a record production during the year of 283,989 short tons of fish meal and 70,016 long tons of fish-body oil. In addition, the canned fish pack, which in 1963 had fallen to 2,500,000 cases, rose to 4,117,865 cases in 1964.

South African Pelagic Shoal Catch and Production of Fish Meal, Fish-Body Oil, and Canned Fish, 1959-1964				
Year	Catch	Production		
		Fish Meal	Fish-Body Oil	Canned Fish
	... (Short Tons)	Long Tons		Cases
1964	1,195,353	283,989	70,016	4,117,865
1963	1,085,806	262,573	46,678	2,506,326
1962	986,301	223,094	57,063	4,841,117
1961	922,362	199,123	57,632	5,218,219
1960	765,318	155,012	40,995	5,234,901
1959	641,787	132,733	31,116	2,871,454

During the 1964 season in the Territory of South-West Africa, the 7 factories at Walvis Bay and 1 factory at Lüderitz received 723,057 short tons of pilchards and 718 tons of anchovy. That record catch was reduced to 175,186 short tons of fish meal and 48,159 long tons of fish-body oil. The Walvis Bay factories also packed 3,574,347 cases of canned fish.



Fig. 1 - A 51-foot Walvis Bay vessel with a full load of pilchards.

On the Cape West Coast of South Africa in 1964, 15 factories received 282,301 short tons of pilchards, 27,279 tons of maasbanker, 57,368 tons of mackerel, and 104,630 tons of anchovy (a total of 471,578 tons) and reduced that catch to 108,803 short tons of fish meal and 21,857 long tons of fish-body oil. The canned fish pack was 543,518 cases.



Fig. 2 - A modern fish meal plant at Alfred Basin, Cape Town.

The South African pelagic shoal catch has increased steadily since 1959 when 641,787 short tons were landed. During 1959-1964, fish meal output also increased sharply, but production of fish-body oil and canned fish showed considerable fluctuation. (The South African Shipping News and Fishing Industry Review, February 1965.)

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PELAGIC SHOAL CATCH, JANUARY-NOVEMBER 1964:

By the end of November 1964, Cape shoal fishing vessels of the South Africa Republic had brought the 1964 season catch of pilchard, anchovy, maasbanker, and mackerel up to 462,930 short tons.

In South-West Africa all 8 factories at Walvis Bay and Lüderitz had completed their quotas for the year after processing a total of 723,057 tons of pelagic fish (mostly pilchard).

The combined pelagic shoal fish catch in the South Africa Republic and Territory of South-West Africa in January-November 1964 totaled 1,185,987 tons. That was made up of 1,006,610 tons of pilchard (284,271 tons from Cape waters), 98,013 tons of anchovy (Cape 97,295 tons), 25,438 tons of maasbanker, and 55,926 tons of mackerel.

South Africa Republic (Contd.):

The limited shoal fishing allowed off the Cape in November 1964 yielded a catch of 16,785 tons of anchovy and 4,054 tons of maasbanker. (The South African Shipping News and Fishing Industry Review, January 1965.)

Note: See Commercial Fisheries Review, May 1965 p. 87.

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NEW STERN TRAWLERS DELIVERED FROM FOREIGN SHIPYARDS:

Late in 1964, a British shipyard in Lowestoft launched the stern-trawler Corvina for a South African-Spanish trawling company. The new vessel is a sistership of the 300-ton stern-trawler Sea Horse, which arrived in Hout Bay, South Africa, in June 1964. The Corvina was scheduled to sail for Hout Bay in March 1965.

Another South African trawling company took delivery of the new 576-ton stern-trawler Pionier II in December 1964 after the vessel completed its delivery voyage from a shipyard in the Netherlands to Cape Town. According to previous reports, the Pionier II will help supply a filleting and freezing plant near Cape Town.

A third South African company took delivery of the stern-trawler Hawthorn in January 1965 after the vessel completed its delivery trip from a shipyard in Aberdeen, Scotland, to Cape Town.

The new stern trawlers will help diversify South African fisheries. (The South African Shipping News and Fishing Industry Review, January 1965.)

Note: See Commercial Fisheries Review, Jan. 1965 p. 87 and July 1964 p. 73.

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SHARK FISHING TESTS OFF NATAL:

Three weeks of experimental long-line fishing for sharks off the South African east coast in the Natal area were scheduled in early 1965 by the Government research vessel Sardinops (operated by the Division of Sea Fisheries). An investigation of shoal fish, tuna, and plankton was to be included in the shark study.

If experimental long-lining for sharks yields good results, it may be possible to start a commercial shark fishery off the Natal coast. That would not only add another fish species to the catch of local vessels, but

might also help reduce the shark danger along Natal beaches. (The South African Shipping News and Fishing Industry Review, January 1965.)



Taiwan

TUNA FLEET:

Taiwan's tuna long-line fleet at the end of 1964 numbered 678 vessels (19,133 gross tons), according to a survey conducted by the Japan Frozen Tuna Producers Association. Of that number, 38 vessels were over 100 gross tons in size. Tuna production by that long-line fleet in 1964 included 7,000 metric tons landed at Kaohsiung, southern Formosa, and approximately 3,500 tons delivered to American Samoa. (Suisan Tsushin, March 30, 1965.)

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FISH CONSUMPTION TRENDS:

Annual per capita consumption of fishery products in Taiwan averages 27.3 kilos (60.2 pounds), according to a 1963 survey of 1,000 representative families conducted by the Taiwan Fisheries Bureau. (Editor's Note: Consumption data reported by the Taiwan Fisheries Bureau may be on a round weight basis. The Food and Agriculture Organization has reported annual per capita consumption of fishery products in Taiwan in 1961 as 28.7 pounds on an edible weight basis.)

According to the Taiwan Fisheries Bureau, consumption of fish in Taiwan is much greater than the annual per capita consumption of meat (about 25.7 pounds), poultry (about 6.0 pounds), and eggs (about 10.3 pounds).

Annual per capita consumption of fishery products in Taiwan is highest in the fish-producing area (82.0 pounds) and lowest in the rural area (52.9 pounds). Milkfish, sea-bream, and croaker seem to be the most popular species in Taiwan.

All of the 1,000 families interviewed were consumers of fresh fish, and 707 families also ate dry-salted fish, such as sardines, hairtail, bonito, mackerel, and cuttlefish. But only 555 of the 1,000 families interviewed bought canned fish, such as sardines, mackerel, bonito, and eel. The reasons given for not buying canned fish by the other families were: (1) price

Taiwan (Contd.):



Early in the morning every inch of the fish market in Kaohsiung is filled with baskets of fish. They are quickly weighed and removed by truck for retail sale or refrigerated.

too high, (2) not palatable, and (3) not accustomed to it.

As to method of preparation, most families preferred frying. People in fish-producing areas had a relatively high preference for raw fish. Urban people liked fish fried, in soy sauce, or steamed. Rural people liked to dry or steam their fish. (Brief Report on Survey of Fish Consumption, Indo-Pacific Fisheries Council, Food and Agriculture Organization.)



U.S.S.R.

SOVIET TRAWLING ACTIVITIES OFF SOUTH AFRICA, DECEMBER 1964:

The Soviet trawling fleet operating off the South African coast was reported to have

shifted its operations northward in December 1964. At that time a fleet of 15 Soviet trawlers was said to be fishing off the mouth of the Kunene River, which is the border between South-West Africa and Angola. Soviet trawlers were also reported off the mouth of the Congo River.

In the past the Soviet trawling fleet seeking groundfish off South Africa has usually moved somewhat to the north in late November and then returned to waters off the South Africa Republic in February or March.

The Soviet tanker Ventspils called at Walvis Bay in late November 1964 after refueling the Soviet fishing fleet off South Africa. The vessel, which is reported to have a capacity of 3,000 tons of oil, took on stores and fresh water at Walvis Bay before returning to its home port on the Baltic Sea. (The South African Shipping News and Fishing Industry Review, January 1965.)

Note: See Commercial Fisheries Review, March 1965 p. 93.

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FREEZER-TRAWLER "ZAPOLJARNYJ"
BUILT FOR SOVIETS BY
DANISH SHIPYARD:

The 2,550-ton freezer-trawler M/S Zapoljarnyj was launched March 30, 1965, by a shipyard in Copenhagen, Denmark, for V/O Sudoimport, Moscow. The vessel is another in the series of 15 freezer-trawlers for the



The M/S Zapoljarnyj in construction dock at Copenhagen.

U.S.S.R. (Contd.):

U.S.S.R. being built by the Danish shipyard to the following specifications: length between perpendiculars 91 meters (298.5 feet), breadth 16 meters (52.5 feet), and deadweight tonnage 2,550 to 2,600 metric tons. The first vessel in the series was the M/S Skryplev launched May 10, 1962.

The M/S Zapoljarnyj is powered by a 6-cylinder diesel engine developing 3,530 horsepower at 200 r.p.m. Speed on loaded trials was 14 knots. The vessel is designed to serve mainly as a refrigerator vessel, but it can also operate as a stern trawler. It is equipped with a large stern chute for trawling and also for hauling aboard catches of other vessels.

The propulsion machinery as well as the refrigerating plant are located amidships, with large refrigerated cargo holds fore and aft. The entire superstructure is arranged amidships.

The rigging consists of two pairs of self-supporting derrick posts. The foremost pair is provided with a top mast as well as a self-supporting combined signal and radar mast. The derricks (four 3-ton and two 7-ton) are served by four 3-ton and two 5-ton winches. The deck machinery also includes one anchor winch, two 3-ton warping winches, and one 15-ton trawl winch. All winches are electric-hydraulic. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, April 9, 1965.)

Note: See Commercial Fisheries Review, April 1965 p. 87, and Mar. 1965 p. 93.

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ANOTHER TROPIK-CLASS STERN TRAWLER DELIVERED BY EAST GERMANY:

The 43rd stern trawler of the Tropik-class was delivered to the Soviet Union in early December 1964 by the People's Shipyards at Stralsund, East Germany. The Tropiks are 2,600-gross-ton vessels and carry a crew of about 75. Although they are basically trawlers, that class vessel is also equipped for long-lining, electric-light fishing, and purse seining. The vessel catch is mostly frozen (daily capacity 30 metric tons), but some is also processed into fish meal and fish oil.

As of April 1965, most of the Soviet Tropiks operated off northwest and southwest Africa and in the Indian Ocean. Some have been

observed on Georges Bank in the North Atlantic, and also off the United States Middle and South Atlantic coasts.

Under a contract negotiated with East Germany in 1961, an additional 23 vessels of that type are to be delivered to the Soviet Union by the end of 1965.

Note: See Commercial Fisheries Review, December 1964 p. 94.

* * * * *

NEW BALTIC SEA BASE FOR FREEZERSHIP FLEETS:

The Soviet Baltic port of Klaipeda is the site of a new centralized base for Soviet marine fishing fleets. The "Klaipeda refrigerator-fleet base" will supply gear, packaging material, food stores, and fuel oil to Soviet transport and fishing vessels.

Concentration of management is said to be the object of the new base which was established by a decree of the Soviet Board of the Main Administration of Fisheries of the Western Basin in the Lithuanian Production Department of Fisheries. (Rybnoe Khozyaistvo, 41 (1), 1965.)



United Kingdom

FISHERY LOAN INTEREST RATES REVISED:

The British White Fish Authority announced that their rates of interest on loans made as from February 6, 1965, would be as follows:

For processing plants: on loans for not more than 20 years, $7\frac{3}{4}$ percent (increase $\frac{7}{8}$ percent).

For fishing vessels of not more than 140 feet, new engines, nets and gear: on loans for not more than 5 years, $7\frac{3}{8}$ percent (increase $1\frac{1}{4}$ percent); on loans for more than 5 years but not more than 10 years, $7\frac{1}{8}$ percent (increase 1 percent); on loans for more than 10 years but not more than 15 years, 7 percent (increase $\frac{3}{4}$ percent); on loans for more than 15 years but not more than 20 years, 7 percent (increase $\frac{5}{8}$ percent).

The rates on advances made before February 6, 1965 are unchanged. (Fish Trades Gazette, London, February 20, 1965.)

* * * * *

United Kingdom (Contd.):

TRAWLER "STELLA LEONIS" REPEATS AS WINNER OF SILVER COD TROPHY IN 1964:

The 190-foot trawler Stella Leonis won the British Silver Cod Trophy in 1964 for the second successive year, after a very close race with the Somerset Maugham. The trophy is



Silver Cod Trophy winner in 1964. The Stella Leonis is fitted for starboard fishing only. Fish storage hold has a capacity of 18,170 cubic feet.

presented annually to the British distant-water vessel with the largest catch for the year.

In 1964, the Stella Leonis after 340 days at sea landed 35,505 kits (4,970,700 pounds) valued at £144,153 (US\$403,628). The runner-up Somerset Maugham after 337 days at sea landed 35,418 kits (4,958,520 pounds) valued at £150,976 (\$422,733).

The winning margin of the Stella Leonis was only 12,180 pounds--the smallest on record--and the value of her catch was actually surpassed by the Somerset Maugham. The outcome of the race was in doubt right up to the final weighout of the season.

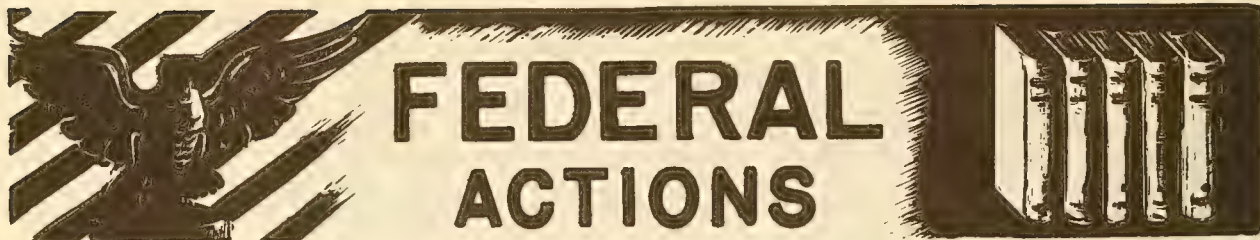
The Stella Leonis was also the winner of the Silver Cod Trophy in 1963 with landings of 39,556 kits (5,537,840 pounds) valued at £161,500 (\$452,200). The record for the competition which started 11 years ago is held by the Kirkella, which landed 46,589 kits or 6,522,460 pounds.

Note: See Commercial Fisheries Review, May 1964 p. 77 and March 1964 p. 75.

**U. S. SCIENTIST REARS BROWN SHRIMP FROM EGGS**

The first successful rearing of brown shrimp from eggs has been accomplished by a biologist of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex., after almost five years of concentrated effort. He is one of four scientists in the world known to have been successful in rearing shrimp from eggs. Only 2 of those 4 scientists have successfully duplicated their experiments--the U. S. Bureau of Commercial Fisheries scientist and a scientist in Japan. The Japanese scientist, who has worked in the field for 22 years, runs a commercial shrimp farm which supplies Japanese fish markets with a product similar to that of the commercial white shrimp of the United States. Scientists of the University of Miami (Florida) have successfully reared pink shrimp from eggs. A French woman scientist has grown a species of shrimp from eggs. The United States scientist has also successfully raised rock shrimp.

A "key" to aid researchers in identification of the larval stages of the brown shrimp in plankton samples is in process. Studies to refine techniques and develop economical methods for artificial culture of shrimp in commercial quantities will be carried out. The brown shrimp (Penaeus aztecus) is one of the three most important commercial shrimp resources of the South Atlantic and Gulf coasts of the United States.



Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

OYSTER INDUSTRY STUDY TO BE CONTINUED IN WILLAPA BAY, WASHINGTON:

Approval of a \$32,000 technical assistance project to finance a second year's work in oyster production research at Willapa Bay, Wash., was announced April 9, 1965, by the Area Redevelopment Administration (ARA).

The project, requested by the Washington State Department of Fisheries, continues a program designed to develop ways to increase the yield of marketable oysters, increase the nutrient level of oyster beds through application of chemical fertilizers, and increase the production of local oyster seed.

A review of the findings of the program after the first year shows that it holds promise of ultimately increasing employment and income in the Willapa Bay area.

The project has already helped the oyster industry in Willapa Bay to increase its supply of seed oysters.

Note: See Commercial Fisheries Review, Feb. 1964 p. 88.



Department of the Interior

FISH AND WILDLIFE SERVICE

GOVERNMENT-INDUSTRY MEETING ON PROPOSED REVISED STANDARDS FOR GRADES OF FROZEN RAW BREADED SHRIMP:

The U. S. Bureau of Commercial Fisheries received comments and objections to the Proposed Revised Standards for Grades of Frozen Raw Breaded Shrimp which were published

in the Federal Register, March 18, 1965. In addition to the comments, the Bureau also received a request to hold a meeting with industry to discuss the points of objection.

In response to that request, the Bureau held a meeting with industry on April 30, 1965, in Washington, D. C. For the convenience of the industry, the meeting was arranged to coincide with the North American Fisheries Conference.

Note: See Commercial Fisheries Review, Feb. 1965 p. 85, May 1965 pp. 91, 95.

* * * * *

NOTICE OF PROPOSED AMENDED ELIGIBILITY REQUIREMENTS UNDER THE FISHING FLEET IMPROVEMENT ACT OF 1964:

In order to prevent payment of disproportionate amounts to any individual applicant under the Fishing Vessel Construction Differential Subsidy Program and disproportionate subsidy payments in any one region, notice of a proposed amendment to Title 50, Code of Federal Regulations, Part 256, was published in the Federal Register, April 14, 1965. The proposed amendment to provide additional eligibility requirements as published follows:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 256]

FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY

Proposed Revision of Procedures

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by the Act of June 12, 1960 (P.L. 86-516; 46 U.S.C. 1401-1413), as amended, it is proposed to amend 50 CFR Part 256 as set forth below. The purpose of the amendment is to prevent payment of a disproportionate amount of the subsidy to any individual applicant who applies for subsidies for the construction of more than one vessel in a fiscal year or to applicants from one Region during a fiscal year if such payment would prevent another applicant from obtaining a sub-

sidy payment because of a lack of funds available to the Secretary of the Interior for such payments.

This proposed amendment relates to matters which are exempt from the rule making requirements of the Administrative Procedure Act (5 U.S.C. 1003); however, it is the policy of the Department of the Interior that, whenever practicable, the rule making requirements be observed voluntarily. Accordingly, interested persons may submit, in triplicate, written comments, suggestions, or objections with respect to the proposed amendments to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington, D.C., 20240, within 30 days of the date of publication of this notice in the *FEDERAL REGISTER*.

Section 256.2 is amended by adding paragraphs (h) and (i) to read:

§ 256.2 Definitions.

* * *

(h) Affiliate. Any person that directly, or indirectly through one or more intermediates, controls, or is controlled by, or is under common control with the applicant. The term "control", including the terms "controlled by" and "under common control with", means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of the applicant, whether through ownership, by contract, or otherwise.

(i) Region. One of the Administrative Regions or Areas of the Bureau of Commercial Fisheries set forth in the Department of the Interior Departmental Manual, Part 140.3.4.

Section 256.3 is amended by adding paragraph (e) to read:

§ 256.3 Eligibility requirements.

* * *
(e) In addition to those conditions which the Secretary may attach from

time to time under sec. 2(8) of the Act or otherwise, the following conditions shall apply to all applications:

(1) Unless otherwise determined by the Secretary no application for subsidy will be considered in any fiscal year from any applicant or its affiliate who has been awarded a subsidy in that year or has a subsidy application pending.

(2) Unless otherwise determined by the Secretary no application for subsidy will be considered in any fiscal year where the total subsidy, in any one Region or Area, may on the basis of pending and decided applications, exceed thirty percent (30 percent) of the total funds available for obligation in such fiscal year.

STEWART L. UDALL,
Secretary of the Interior.

APRIL 7, 1965.

* * * * *

PROPOSED AMENDED REGULATIONS UNDER THE COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT:

Notice of a proposal to adopt amendments to Title 50, Code of Federal Regulations, Part 253--Commercial Fisheries Research and Development--was published in the *Federal Register*, April 15, 1965. The proposed amendments would apply only to Sections 253.2 (a) and 253.3 (f) of the regulations.

The regulations in 50 CFR Part 253 brought into effect the Commercial Fisheries Research and Development Act of 1964 (P. L. 88-309). That Act provided, among other things, for the payment under Section 4(a) of \$5 million annually to States for commercial fishery research and development over a 5-year period. Congress adjourned in 1964 before it was able to appropriate funds to implement that portion of the Act.

States are required to provide matching funds equal to at least 25 percent of the cost of a project financed under Section 4(a) of P. L. 88-309. Generally the matching funds provided by States must be additional funds allocated for the particular project and not funds diverted from some other commercial fishery project. But a limited exception to that requirement was provided in Section 253.2 (a) of the regulations, for the benefit of those States in which the legislature did not meet after the Act was approved. In such case, the taking of State matching funds from appropriations for other fishery projects could be considered in fiscal years 1965 and 1966. The purpose of the proposed amendment to Section

253.2 (a) is to extend that exception for a limited time after Federal funds are appropriated to implement the Act.

The purpose of the proposed amendment to Section 253.3 (f) of the regulations is to provide an exception to State contracting procedures in respect to contracts for research and development and professional services.

The proposed amendments relate to matters which are exempt from the rule making requirements of the Administrative Procedures Act. However, interested persons were given the opportunity to submit written comments, suggestions, or objections with respect to the proposed amendments to the Director, Bureau of Commercial Fisheries, Department of the Interior, Washington, D. C., before May 15, 1965.

Note: See *Commercial Fisheries Review*, Dec. 1964 p. 118.



United States District Court

CERTAIN GULF SHRIMP FISHERMEN HELD TO BE INDEPENDENT CONTRACTORS FOR TAX PURPOSES:

On February 24, 1965, in the tax refund case, *Sea Garden Corporation and Deep Sea Trawlers, Inc. v. United States*, Judge McRae in the United States District Court for the Middle District of Florida ruled that captains and crewmen working on a share basis on

plaintiffs' shrimp trawlers were not employees, but independent contractors for Federal employment tax purposes.

In his opinion, Judge McRae said, "There was no evidence of any effort on the part of plaintiffs to control the captains and crewmen to such an extent that their status would be one of 'employee' (master and servant) under common law rules."

The plaintiffs owned a number of shrimp trawlers which operated in the Gulf of Mexico off the coast of Texas and Mexico. Plaintiffs selected experienced fishermen to serve as captains of their shrimp trawlers.

The Court found, among other things, that: "After an individual was selected as captain, the arrangement between the plaintiffs and the captain was concluded and the boat was turned over to him by plaintiffs Each captain determined the qualifications of and selected his crewmen Each captain had charge of his crew and determined (i) when to depart on a fishing trip, (ii) when to return, (iii) where to fish (that is, the fishing ground to work), (iv) when to fish, (v) how to fish (that is the actual mechanical process of operating the fishing nets and gear), and (vi) all other matters concerning the operation, maintenance, and fishing of the boat from the time of departure from plaintiffs' dock until the return of the boat from a particular trip. The foregoing were the prerogatives of the captains. The crewmen looked to the captains for their orders."

Some of the actual methods of operation mentioned by Judge McRae in his opinion were: "The captain decided how much fuel and ice to take aboard The payment to the crew for each trip depended entirely upon the proceeds of the catch. The length of any trip depended upon many factors, such as the capacity of the boat, the fuel and ice supply, the weather, and run of the shrimp When the fishing was off Campeche, Mexico, a trip may have lasted as long as 60 days, in the captain's discretion, before returning to port There was no guarantee of any kind of compensation to the captain, regardless of the time or effort expended for attempting to catch shrimp There was no express agreement specifying the extent to which plaintiffs had control over the fishing activities of the captains The plaintiffs' boats were not equipped with ship-to-shore telephones. They were equipped with radios which

permitted contact with the boats only through the marine operator. The communication between plaintiffs and the boats during fishing was infrequent, usually only in cases of emergency The captains were not required to, nor did they keep any kind of ship's log The plaintiffs had no agreement with any of the captains which entitled them to a preferred call on the captains' time and services beyond the immediate trip."

As regards evidence of control by plaintiffs of captains and crews, Judge McRae found, in part, that: "Plaintiffs had certain general policies which were known to the captains and crews and which were part of the arrangement between plaintiffs and each captain; for example intoxicating liquors were not to be taken aboard the boat The boats were to be fished in the Gulf of Mexico and the catches were to be brought back to Brownsville, Tex., if possible and sold at the highest market price obtainable. Plaintiffs would terminate relations with a captain whose actions would tend to injure personnel and property." But Judge McRae held that "The degree of control exercised by the plaintiffs in the marketing of the product which was jointly owned with the fishermen was not such as to create the relationship of employer-employee (master and servant) under common law rules."

Judge McRae ruled that the essential facts in the case were not different from those considered by the United States District Court for the Southern District of Texas in the case of Crawford Packing Co. v. United States, findings and conclusions reported 228 F. Supp. 549 (1962) and affirmed 330 F. 2d 1964 (CA-5, 1964). The District Court in that case found that the shrimp fishermen were not employees under the Social Security Act.

Note: See Commercial Fisheries Review, July 1964 p. 88, Jan. 1964 p. 79, July 1963 p. 107, Aug. 1962 p. 78, and May 1962 p. 78.



Eighty-Ninth Congress (First Session)



Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, per-

tinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ALASKA FUR SEAL: Rep. Sullivan in Congressional Record, Apr. 13, 1965 (pp. 7703-7704) commented on the Interior Department award of Government contract for processing Alaska fur seal skins.

BIOLOGICAL RESEARCH VESSEL DEDICATION: Rep. Henderson (Congressional Record, May 4, 1965, pp. 9110-9111) speaking from the floor of the House, stated that he attended the dedication ceremonies of the biological research vessel Eastward on May 1, 1965. This vessel has been provided by the National Science Foundation to Duke University and will be operated from the University's Marine Biological Laboratory located on Pivers Island in the Beaufort-Morehead City Harbor. He inserted the speech made at the ceremonies by John M. Drewry, Chief Counsel of the House Committee on Merchant Marine and Fisheries.

CALIFORNIA: Bodega Bay, California; H. Doc. 106. Letter from the Secretary of the Army, transmitting a letter from the Chief of Engineers, Department of the Army, Dated November 6, 1964, Submitting a Report, Together with Accompanying Papers and Illustrations, on a Review of the Reports on Bodega Bay, California, requested by a Resolution of the Committee on Public Works, House of Representatives, Adopted June 3, 1959, referred to Committee on Public Works, House of Representatives, 89th Congress, 1st session, Mar. 10, 1965, 109 pp., illus., printed. Contains favorable report from the Army Chief of Engineers on the construction of a mole and channel in Bodega Bay, Calif. Report of District Engineer discusses authority, scope of survey, Tributary area, bridges, prior reports, existing Corps of Engineers' project, local cooperation on existing and prior projects, other improvements, terminal and transfer facilities, vessel traffic, plan of improvement, shoreline changes, estimate of benefits, comparison of benefits and costs, proposed local cooperation, apportionment of costs; also contains comments from various Federal agencies. One section of the report deals with increased fish catch, increased party boat sportsfishing, and commercial fishing.

COMMERCIAL FISHERIES AND SPORT FISHERIES SEPARATION: S. 1778 (Magnuson) introduced in Senate Apr. 13, 1965, to establish the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife as separate services in the Department of the Interior and to abolish the U. S. Fish and Wildlife Service; to Committee on Commerce. Sen. Magnuson pointed out the need (Congressional Record, Apr. 13, 1965, pp. 7549-7550) to create within the Department of the Interior an Assistant Secretary for Commercial Fisheries and an Assistant Secretary for Sport Fisheries and Wildlife since the two interests (one in the development of commercial fisheries and the other in the furtherance of sport fisheries and wildlife) are obviously different although equally important.

COMMODITY PACKAGING AND LABELING: Introduced in House, H. R. 7600 (Kastenmeier) Apr. 26, and H. R. 7619 (Dent) Apr. 27, 1965, to regulate interstate and foreign commerce by preventing the use of unfair or deceptive methods of packaging or labeling of certain consumer commodities distributed in such commerce, and for other purposes; to Committee in Interstate and Foreign Commerce.

Senate Committee on Commerce, Apr. 28-30, 1965, held hearings on S. 985, to prevent unfair or deceptive methods of packaging or labeling of commodities distributed in interstate commerce. Hearings continue. S. 985 (Hart and 12 others) introduced in Senate Feb. 3, 1965; to Committee on Commerce.

CONTINENTAL SHELF FISHERY RESOURCES: Senate received a joint resolution of the Legislature of the State of Washington (Senate Joint Memorial 17) urging the President of the United States to issue a proclamation "(1) Prohibiting foreign fishing in some or all of the waters of the Continental Shelf up to distances of 12 miles, or (2) protect, preserve and assist in the development of our fisheries resources by establishing a Marine Exploration and Development Commission;" to Committee on Commerce. Further urges the Congress to enact legislation designed to (1) implement the President's proclamation, and (2) protect, preserve and assist in the development of our fisheries resources by setting up the Commission mentioned.

FISH FARMING: S. 1671 (Fulbright) introduced in Senate Apr. 1, 1965, to amend the Consolidated Farmers Home Administration Act of 1961 in order to increase the amount for which loans may be made under such Act for fish farming; to Committee on Banking and Currency. Would provide loans up to \$125,000 for fish farming in lieu of \$60,000.

FISHING VESSEL REPLACEMENT RESERVE FUND: S. 1858 (Bartlett) introduced in Senate Apr. 30, 1965, to promote the replacement and expansion of the U. S. non-subsidized merchant and fishing fleets; to Committee on Commerce. Sen. Bartlett (Congressional Record, Apr. 30, 1965, (pp. 8714-8716) pointed out that what this bill in essence does is allow merchant vessel operators to commit themselves by contract with the Secretary of Commerce, and fishing vessel owners with the Secretary of the Interior, for the establishment of a vessel replacement reserve fund. Into this fund must be deposited the proceeds of the sale of any vessel, proceeds of any insurance and indemnities, annual depreciation charges, earnings made on deposits in the fund, and may be deposited moneys from other sources such as operating earnings. Such deposits are treated as tax deferred but only if they are used for this exclusive national interest purpose--the replacement and modernization of merchant or fishing vessels. The present fishing fleet is composed of approximately 12,000 vessels. Ninety percent of these are extremely small craft capable of fishing only inland and coastal waters; two-thirds of the present U. S. fishing fleet is over age; 50 percent was constructed 30 years ago. Also H. R. 7956 (Keith) introduced in House May 6, 1965; to Committee on Merchant Marine and Fisheries.

FOOD MARKETING NATIONAL COMMISSION: House April 5, 1965, suspended the rules and passed without amendment H. R. 5702, to extend for 1 year the date on which the National Commission on Food Marketing shall make a final report to the President and to the Congress and to provide necessary authorization of appropriations for such commission.

Senate Apr. 6, 1965, received for concurrence House-passed bill; to Committee on Agriculture and Forestry. Senate Committee on Commerce, in executive session, Apr. 27, 1965, ordered favorably reported H. R. 5702. Committee Apr. 30, 1965, reported (S. Rept. No. 174) to Senate H. R. 5702, without amendment.

S. Rept. 174, Extension of National Commission on Food Marketing (Apr. 30, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany H. R. 5702), 4 pp., printed. Committee reported bill favorably without amendment. Includes purpose, cost, and executive communications.

Senate May 3, 1965, passed without amendment and cleared for President H. R. 5702.

Commission on May 5, 1965, began hearings on a study of food retailing. Hearings continued May 6.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1966: Departments of Labor and Health, Education, and Welfare Appropriations for 1966: Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, 89th Congress, 1st Session, Part 1 (Exclusive of Public Health Service), 1,548 pp., Part 2, 824 pp., Part 3, 840 pp., Part 4, 835 pp., illus., printed. Includes statements and budget summaries from the agencies covered, as well as statements from outside agencies. Includes testimony of Congress, interested organizations and individuals on funds for botulism research under the Food and Drug Administration; water pollution control under Office of the Secretary; pesticide activities, water supply and water pollution control, shellfish sanitation program and botulism under the Public Health Service.

H. R. 7765, introduced in House May 5, 1965, making appropriations for the Departments of Labor, and Health, Education, and Welfare, and related agencies, for the fiscal year ending June 30, 1966, and for other purposes; to Committee on Appropriations.

H. Rept. 272, Departments of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1966 (Apr. 29, 1965, report from Committee on Appropriations, 89th Congress, 1st session, to accompany H. R. 7765), 71 pp., printed.

HIGHWAYS AND FISH AND WILDLIFE PROTECTION: H. R. 7561 (Fulton of Pa.) introduced in House Apr. 22, 1965, to amend title 23 of the United States Code relating to highways in order to require the approval of the Secretary of the Interior to surveys, plans, specifications, and estimates for projects on the Federal-aid highway systems for the purpose of protecting fish and wildlife and recreation resources; to Committee on Public Works. (Similar to bills in 88th Congress; no action.)

HUDSON RIVER FISHERY RESOURCES: Rep. Ottinger (Congressional Record, May 3, 1965, pp. 8869-8871) spoke from the floor of the House in support of a bill (H. R. 3012) he introduced in Jan., to provide for the establishment of the Hudson Highlands National Scenic Riverway in the State of New York. Rep. Ottinger inserted an article by Robert Boyle, an editor of Sports Illustrated, which documents the destruction of the Hudson's unique anadromous fish by interests exploiting the river's resources.

Rep. Bingham Congressional Record, May 4, 1965 (p. 9110) was granted permission to extend his remarks and to insert in the record a letter from Dominic J. Pirone, a biologist and consultant for the League of Saltwater Sportsmen, which appeared in the Tarrytown News on Apr. 22, 1965. Letter supports H. R. 3012.

INTERIOR DEPARTMENT: Cain Nomination: Hearing before the Committee on Commerce, United States Senate, 89th Congress, 1st session, on nomination of Stanley A. Cain, of Michigan, to be Assistant Secretary of the Interior for Fish and Wildlife, Mar. 16, 1965, Serial No. 89-3, 24 pp., printed. Contents include biographical sketch, and statements and letters of various members of Congress.

INTERIOR DEPARTMENT APPROPRIATIONS REQUEST FY 1966: Department of the Interior and Related Agencies Appropriations for 1966: Hearings before Subcommittee of the Committee on Appropriations, United States Senate, 89th Congress, 1st Session, on H. R. 6767, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1965, and for other purposes. Part 1, Feb. 15-26, 1965, 1,047 pp., Part 2, Mar. 1-10, 1965, 967 pp., printed. Included are funds for the Fish and Wildlife Service and its two Bureaus: Commercial Fisheries and Sport Fisheries and Wildlife. Subcommittee Apr. 26, 1965, in executive session, approved bill for full committee consideration.

Committee on Appropriations Apr. 29, 1965, filed in Senate report (S. Rept. No. 172) on H. R. 6767.

S. Rept. 172, Interior Department and Related Agencies Appropriation Bill, 1966 (Apr. 29, 1965, report from Committee on Appropriations, 89th Congress, 1st session, to accompany H. R. 6767), 46 pp., printed. The Committee recommended increases for the Bureau, over the House allowances, as follows: (1) Under Management and Investigations of Resources (\$1,050,000)--\$250,000 for Pacific coast oyster mortality studies; \$370,000 to initiate an ocean engineering program; and \$430,000 for research to revitalize the Great Lakes fishing industry. (2) Under Construction (\$175,000)--\$100,000 to restore reductions made by the House in funds budgeted for the Columbia River program; and \$75,000 for construction and installation of fish screens in the Salmon River drainage, Idaho. (3) Under Federal Aid for Commercial Fisheries Research and Development (\$1,600,000): \$1,150,000 for apportionment to States; \$300,000 for resource disaster aid; and \$150,000 for program administration.

Rep. Race in Congressional Record, May 3, 1965 (pp. A2092-A2093), in extension of remarks inserted an announcement by Sen. Nelson (Wis.) that the Senate Appropriations Committee has approved five key budget requests which offer new hope to the Great Lakes area--ultimate approval probably will rest with a Senate-House conference committee. Of interest to the Bureau are the following: (a) \$430,000 to help Great Lakes fishermen, hurt by the sea lamprey and last year's marketing difficulties (less than the \$1.43 million requested by Sen. Nelson, the Great Lakes Conference on Senators, and the Midwest Fisheries Council; however, the House had refused to appropriate anything for this purpose); (b) \$5,600,000 to implement the Commercial Fisheries Research and Development Act of 1964, to finance research and disaster aid (when Act was approved last year, \$5.5 million was authorized, but the 1966 budget recommended only \$2 million and the House added \$2 million).

INTERNATIONAL FISHERY TREATIES STUDY: Presented to House Apr. 14, 1965, a memorial of the Legislature of the State of Massachusetts relative to establishing a special commission for the purpose of conducting a study of existing international fishing treaties and recommending such treaty modifications

as it may deem necessary to the protection of the fishing industry; to Committee on Merchant Marine and Fisheries.

Senate received Apr. 21, 1965, a similar resolution from the General Court of the Commonwealth of Massachusetts; to Committee on Commerce.

MARINE BIOLOGICAL LABORATORY: S. 1735 (Magnuson) introduced in Senate Apr. 7, 1965, and H. R. 7778 (Bonner) introduced in House May 3, relating to use by the Secretary of the Interior of land at La Jolla, Calif., donated by the University of California for a marine biological research laboratory, and for other purposes; Senate bill to Committee on Commerce; House bill to Committee on Merchant Marine and Fisheries. Sen. Magnuson inserted in Congressional Record (Apr. 7, 1965, p. 7010) letter from the Under Secretary of the Interior requesting proposed legislation.

MARINE EXPLORATION AND DEVELOPMENT ACT: Senate Apr. 22, 1965, received a joint resolution of the Legislature of the State of Alaska (Senate Joint Res. 50) strongly endorsing S. 1091 and urging the Congress of the United States to take appropriate action to insure its prompt passage; to Committee on Commerce. S. 1091 would establish and announce U. S. policy to undertake and accelerate program of exploration and economic development of the physical, chemical, geological, and biological resources of the Continental Shelf.

Presented by Speaker to House Apr. 26, 1965, a memorial of the Legislature of the State of Alaska, relative to endorsing S. 1091.

MINIMUM WAGE: S. 1770 (Javits) introduced in House Apr. 13, 1965, to amend the Fair Labor Standards Act to provide for an increase in the minimum wage; to the Committee on Labor and Public Welfare. Would raise minimum to \$1.50 an hour.

NAVIGATION FEES: S. 1875 (Magnuson) introduced in Senate May 3, 1965, to repeal and amend certain statutes fixing or prohibiting the collection of fees for certain services under the navigation laws; to Committee on Commerce. Sen. Magnuson (Congressional Record, May 3, 1965, pp. 8895-8897) pointed out that the proposed legislation would permit the Secretary of the Treasury, under general authority, to fix fees to be collected upon the rendering of any of these services: admeasurement of vessels; registry of vessels; issuance of enrollments, and licenses; or licenses, renewals of licenses, issuance of special certificates to vessels; authorization for changes of names of vessels; furnishing and recording abstracts of title of vessels; recording of evidence of title to, and encumbrances upon, vessels and the discharge of the latter; entry and clearance of vessels; furnishing certificates of ownership of vessels; furnishing copies of documents, records, or other papers filed in offices of collectors of customs or in the Bureau of Customs, and certifying such copies.

NORTH PACIFIC FISHERIES TREATY: Rep. Pelly (Congressional Record, May 3, 1965, p. A2091) in extension of remarks requested that the text of the resolution of the legislature of the State of Washington House of Representatives be inserted in the Record. The resolution states, in part, "... That we offer our support to our sister State of Alaska and to our congressional delegation, and that we express the hope that the problems that have arisen in connection with our fisher-

ies may be successfully resolved at the forthcoming meetings of the North Pacific Salmon Fisheries Commission"

NORTH PACIFIC FISHERY PROBLEMS: Rep. Pelly (Congressional Record, May 3, 1965, pp. A2103-A2105) as a matter of background on problems of our American fishing industry, under unanimous consent, included the text of his remarks in a speech, "Fisheries Problems in General and in the North Pacific in Particular," delivered in Seattle on Apr. 21, at a meeting of Pacific Coast fishermen.

OCEANOGRAPHIC AGENCY OR COUNCIL: Sen. Magnuson Apr. 6, 1965, inserted in Congressional Record (pp. 6857-6858) the resolution (H. J. Res. 23), previously presented to the Senate Mar. 25, adopted by the legislature of the State of Alaska, urging congressional enactment of S. 944, to expand marine research and establish a National Oceanographic Council.

Senate Committee on Commerce, Apr. 12, 1965, held hearings on S. 944. Hearings recessed subject to call.

Sen. Fong (Congressional Record, May 3, 1965, p. 8915) pointed out that the Honolulu Advertiser, a daily newspaper, has established a professional chair in oceanography at the University of Hawaii and provided \$25,000 a year for the services of whatever scientist the university selects to fill it. This will enable the University of Hawaii to augment its State-supported staff in oceanography. The Senator pointed out that hearings on S. 944 have been conducted by the Senate Commerce Committee; and that the views of those in industry and the scientific world have been particularly forceful in endorsing the objectives of that bill, which provides for expanded oceanic research of the scope and stature hoped for by communities like Hawaii.

Introduced in House, H. R. 7301 (Hanna) Apr. 8 and H. R. 7798 (Huot) May 3, 1965, to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes; to Committee on Merchant Marine and Fisheries. Similar to S. 944. H. R. 7849 (Teague of Texas) introduced in House May 4, 1965, to provide for the development of ocean resources, to provide for economic development of the Continental Shelf, to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes; to Committee on Merchant Marine and Fisheries.

OCEANOGRAPHIC LEGAL PROBLEMS: Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries met May 4, 5, and 6 on H. R. 5175, providing for a study of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds.

OCEANOGRAPHIC RESEARCH VESSEL INSPECTION: Senate Committee on Commerce, Apr. 6, 1965, in executive session, ordered favorably reported S. 627, to exempt oceanographic research vessels from the application of certain inspection laws. Committee Apr. 28, 1965, reported (S. Rept. 168) to Senate S. 627.

S. Rept. 168, Exemption of Oceanographic Research Vessels from Certain Inspection Laws (Apr. 28, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 627), 7 pp., printed. Committee reported bill favorably without amendment and recommended passage. Presents pur-

pose, general statement and background, cost, agency comments, and changes in existing law.

Senate Apr. 29, 1965, passed without amendment S. 627.

H. R. 7320 (Keith) introduced in House Apr. 8, 1965; to Committee on Merchant Marine and Fisheries; similar to S. 627.

Senate-passed S. 627 was referred by the House May 3, 1965; to Committee on Merchant Marine and Fisheries.

Subcommittee on Oceanography of House Committee on Merchant Marine and Fisheries met May 4-6, on H. R. 3419.

OCEANOGRAPHY: Representative Lairs (Congressional Record, Apr. 6, 1965, pp. A1672-A1673) in extension of remarks discussed the new science of oceanography and inserted a speech by Congressman Bob Wilson (Calif.) outlining the opportunities ahead in oceanography.

Rep. Wilson in Congressional Record, May 5, 1965, (pp. A2176-A2178) in extension of remarks pointed out that oceanography in America is finally gaining notoriety and momentum. He stated that he was proud of the advances contributed in this area by San Diego, Calif., and inserted in the Record an article entitled "Oceanography in San Diego, Calif."

PESTICIDES AND FISH AND WILDLIFE: Committee on Commerce Apr. 28, 1965, reported (S. Rept. 169) to Senate on S. 1623.

S. Rept. 169, Protection of Fish and Wildlife from Pesticides (Apr. 28, 1965, report from the Committee on Commerce, U. S. Senate, 89th Congress, 1st session, to accompany S. 1623), 11 pp., printed. Committee reported favorably with amendment and recommended passage. Shows purpose, background, committee consideration of bill, Agency comments, and changes in existing law.

Senate Apr. 29, 1965, passed with committee amendment S. 1623, authorizing funds for a continued study of effects on insecticides and other pesticides upon fish and wildlife. As passed by the Senate, Department of Interior's annual appropriation of \$2,565,000 ceiling would be raised to \$3,200,000 for FY 1966 and to \$5 million annually for fiscal years 1967 and 1968.

Senate-passed S. 1623 was referred by the House May 3, 1965, to its Committee on Merchant Marine and Fisheries.

PRICE-QUALITY STABILIZATION: H. R. 7841 (Gilligan) introduced in House, May 4, 1965, to amend the Federal Trade Commission Act, to promote quality and price stabilization, to define and restrain certain unfair methods of distribution and to confirm, define, and equalize the rights of producers and resellers in the distribution of goods identified by distinguishing brands, names, or trademarks, and for other purposes; to Committee on Interstate and Foreign Commerce.

SALMON IMPORT RESTRICTIONS: Apr. 6, 1965, S. 1734 (Magnuson and Bartlett) introduced in Senate and sent to Committee on Commerce; introduced in House Apr. 6 H. R. 7187 (Meeds), Apr. 7 H. R. 7269 (Pelly), Apr. 14 H. R. 7483 (Rivers of Alaska), Apr. 27

H. R. 7661 (Wyatt); referred to Committee on Ways and Means; bills would conserve and protect Pacific salmon of North American origin. Would provide that when the Secretary of the Interior finds that a country is fishing in a manner to diminish the effectiveness of U. S. conservation programs of Pacific salmon of North American origin, the President may increase the duty on any fishery product in any form from such country for such time as necessary to a rate not more than 50 percent above the July 1, 1934 rate. Sen. Magnuson (Congressional Record, Apr. 6, 1965, pp. 6860-6867) remarked that "This legislation would assist the United States in its continuing effort to conserve and protect the salmon resources of the North Pacific by permitting the use of economic sanctions when this becomes necessary to assure that state conservation programs for salmon are not being thwarted by abusive and reckless fishing practices by other nations." The Senator also discussed at some length the coming season for the salmon and halibut fisheries. He inserted a table of 1962 U. S. imports of fishery products from Japan by commodity description; includes the tariff of July 1, 1934, and shows by unit the quantity and value of Japanese fishery imports, and the 1963 tariff. He also inserted an editorial from Fishermen's News of March 1965, second issue, which discusses the problem of Japanese high-seas fishing of Bristol Bay salmon. Senator Magnuson in extension of remarks inserted in Congressional Record (Apr. 6, 1965, pp. A1662-A1663) an editorial ("Pacific Fisheries Competition") which discusses foreign fishing activities in waters adjacent to the United States. Rep. Pelly announced (Congressional Record, Apr. 7, 1965, pp. 6993-6994) that he was hopeful that an early hearing on this legislature could be arranged.

Rep. Rivers (Congressional Record, Apr. 15, 1965, pp. 7796-7797) in extension of remarks stated that within a few weeks fleets of Japanese fishing vessels are expected to begin an intensive harvest of red salmon on the high seas--salmon spawned in large numbers in Alaska's Bristol Bay region.

SUPPLEMENTAL APPROPRIATIONS, FY 1965 (2nd): Second Supplemental Appropriation Bill 1965: Hearings before the subcommittee of the Committee on Appropriations, House of Representatives, 89th Congress, 1st session, Part 1, 745 pp., and Part 2, Appalachian Regional Development, 282 pp., printed. Includes testimony, statements, and exhibits on additional funds for the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife.

H. R. 7091 (Mahon) introduced in House Apr. 2, 1965, making supplemental appropriations for the fiscal year ending June 30, 1965, and for other purposes. Same date Committee on Appropriations filed a report (H. Rept. 224) on H. R. 7091. Includes additional funds for the Bureau of Commercial Fisheries (\$1,125,000) and the Bureau of Sport Fisheries and Wildlife (\$1,200,000) principally to repair flood damage to facilities; also funds for pay costs.

H. Rept. 224, Second Supplemental Appropriation Bill, 1965 (Apr. 2, 1965, report from the Committee on Appropriations, U. S. House of Representatives, 89th Congress, 1st session, to accompany H. R. 7091), 59 pp., printed. Discusses scope and summary of the bill.

Passed House Apr. 6, 1965.

Second Supplemental Appropriation Bill, 1965: Hearings before the Committee on Appropriations, United States Senate, 89th Congress, 1st session, on H. R. 7091,

an act making supplemental appropriations for the fiscal year ending June 30, 1965, and for other purposes, 840 pp., printed. Includes testimony, statements, communications, and reports from various Federal agencies and their officials, as well as Senators.

Subcommittee of Senate Committee on Appropriations held hearings Apr. 7-8, and concluded its hearings Apr. 14 on H. R. 7091. Senate Committee on Appropriations Apr. 23, 1965, in executive session, ordered bill favorably reported with amendments. Bill reported (S. Rept. 167) to Senate on same day.

S. Rept. 167, Second Supplemental Appropriation Bill, 1965 (Apr. 23, 1965, report from the Committee on Appropriations, United States Senate, 89th Congress, 1st session, to accompany H. R. 7091), 58 pp., printed.

Senate passed Apr. 27, 1965, with committee amendments (motion to reconsider tabled) H. R. 7091. Senate insisted on its amendments, asked for conference with House, and appointed conferees.

House Apr. 28, 1965, disagreed to Senate amendments to H. R. 7091; agreed to conference requested by the Senate, and appointed conferees. Conferees agreed to file a conference report on the differences between the Senate- and House-passed versions. Same day Committee of Conference filed report (H. Rept. 270) in House on H. R. 7091.

H. Rept. 270, Supplemental Appropriation Bill, 1965 (Apr. 28, 1965, report from the Committee of Conference, House of Representatives, 89th Congress, 1st session, to accompany H. R. 7091), 10 pp., printed. Committee made recommendations on the disagreeing amendments of the two Houses. In addition to the recommendations, includes statement of the House managers.

By a record vote, Apr. 29, 1965, the House adopted the conference report on H. R. 7091. Same day Senate adopted conference report on H. R. 7091, thus clearing the bill for the White House. Bill was signed Apr. 30, 1965, by the President, P. L. 89-16 (79 STAT 81).

WATER POLLUTION CONTROL ADMINISTRATION:

Water Pollution Control Hearings on Water Quality Act of 1965: Hearings before the Committee on Public Works, House of Representatives, 89th Congress, 1st session, on H. R. 3988, S. 4, and Related Bills, Feb. 18, 19, and 23, 1965, 404 pp., printed. Contents include testimony of various Federal and state officials, members of Congress, associations, water resources commissions, and representatives of business firms. Testimony refers to the need to stop the outpouring of pollution into our streams and lakes, to save clean water from destruction, and to raise the quality of waters already polluted.

H. Rept. 215, Water Quality Act of 1965 (Mar. 31, 1965, report from the Committee on Public Works, U. S. House of Representatives, 89th Congress, 1st session, to accompany S. 4), 29 pp., printed. Committee reported bill favorably with amendments. Discusses purpose and major provisions of the bill, views of the committee, committee recommendation, additional views in support of bill, and changes in existing law.

By unanimous record vote House Apr. 28, 1965, passed and returned to the Senate S. 4, the Water Quality Act of 1965, after adopting a committee substitute

amendment that provided new text. Adopted several perfecting amendments to the committee amendment.

Several Congressmen, speaking in support of S. 4, discussed the damage by water pollution to the shellfish industry and discussed the provision which will authorize the Secretary of Health, Education, and Welfare to take action when he finds that substantial economic injury results from the inability to market shellfish in interstate commerce due to health threats resulting from pollution of interstate or navigable waterways.

Rep. Hanley (Congressional Record, May 3, 1965, pp. A2114-A2117) pointed out that this legislation strengthens and reaffirms our national policy for the prevention, control, and abatement of water pollution. All of the functions of the Department of Health, Education, and Welfare in the area of water pollution control will be invested in a Federal Water Pollution Control Administration. Recently the Syracuse Herald-Journal has published a series of excellent articles on the major pollution problems in the 34th district.

WATER POLLUTION IN U. S. NAVIGABLE WATERS:

H. R. 7976 (Stalbaum) introduced in House and S. 1908 (Nelson) introduced in Senate May 6, 1965, to expand and improve existing law and to provide for the establishment of regulations for the purpose of controlling pollution from vessels and certain other sources in the Great Lakes and other navigable waters of the United States; to Committee on Merchant Marine and Fisheries and to Committee on Public Works, respectively. Sen. Nelson in Congressional Record, May 6, 1965 (pp. 9477-9481), pointed out that the bill will meet a phase of the pollution problem which is often neglected--the pollution resulting from vessels and shore installations. The bill gives the Secretary of Health, Education, and Welfare the authority to establish reasonable regulations and standards for facilities to be used in the retention or treatment of sewage and refuse. Waters are being polluted by oil, sewage, and refuse of every kind discharged or dumped by vessels plying them. It is necessary that the disposal by vessels be controlled by forbidding it to the greatest practical extent, by establishing standards for treatment before disposal, and by designating points and places where disposal may take place.

WATER PROJECT RECREATION ACT: Water Project Recreation Act: Hearing before the Committee on Interior and Insular Affairs, United States Senate, 89th Congress, 1st session, on S. 1229, a bill to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of federal multiple-purpose water resource projects, and to provide the Secretary of the Interior with authority for recreation development of projects under his control, Mar. 23, 1965, 69 pp., printed. Contents include statements and communications of various Federal and state officials, Senators, and associations.

Senate Apr. 7, 1965, received report (S. Rept. 149) of the Committee on Interior and Insular Affairs, with amendments, on S. 1229, proposed Federal Water Project Recreation Act.

S. Rept. 149, Federal Water Project Recreation Act (Apr. 7, 1965, report from the Committee on Interior and Insular Affairs, U. S. Senate, 89th Congress, 1st session, to accompany S. 1229), 31 pp., printed. Committee reported bill favorably with amendments. Discusses purpose, background of measure, committee amendments, section-by-section analysis, separable

costs-remaining benefits method of cost allocation, and changes in existing law; presents Departmental reports.

Senate passed Apr. 13, 1965, with committee amendments, S. 1229. Motion to reconsider passage was tabled.

Senate Apr. 14, 1965, asked for concurrence of the House on Senate-passed S. 1229; to House Committee on Interior and Insular Affairs.

Committee on Interior and Insular Affairs Apr. 27, 1965, filed in House report (H. Rept. 254) on H. R. 5269, to provide uniform policies with respect to recreation and fish and wildlife benefits and costs of Federal multiple-purpose water resource projects, and to provide the Secretary of the Interior with authority for recreation development of projects under his control; with amendment; to Committee of the Whole House on the State of the Union.

H. Rept. 254, Federal Water Project Recreation Act (Apr. 27, 1965, report from the Committee on Interior and Insular Affairs, House of Representatives, 89th Congress, 1st session, to accompany H. R. 5269), 28 pp., printed. Committee reported bill favorably with a amendment and recommended passage. Presents pur-

pose, need, cost, committee amendment, section-by-section analysis, and changes in existing law.

WATER RESOURCES PLANNING ACT: Senate Apr. 5, 1965, received for concurrence House-passed version of S. 21, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commission and by providing financial assistance to the States in order to increase State participation in such planning; to Committee on Interior and Insular Affairs.

Senate Apr. 9, 1965, disagreed to House amendments to S. 21, proposed Water Resources Planning Act, asked for conference with House and appointed conferees.

House Apr. 13, insisted on its amendment to S. 21, agreed to a conference requested by the Senate, and appointed conferees.

Note: REPORT ON FISHERY ACTIONS IN 88TH CONGRESS: The U. S. Bureau of Commercial Fisheries has issued a leaflet on the status of all legislation of interest to commercial fisheries at the end of the 88th Congress. For copies of MNL-3--"Legislative Actions Affecting Commercial Fisheries, 88th Congress, 1st Session 1963 and 2nd Session 1964," write to the Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 N. Fort Myer Drive, Room 510, Arlington, Va., 22209. Requests for this leaflet will be filled on a first-come first-served basis until the supply is exhausted.



FISH NOISES

Sounds or noises made by fish are as common as the sounds of birds, but only with the development of adequate hydrophones has it been possible to "tune in" on this aspect of fish behavior. Among the most comprehensive and thought-provoking discussions of the sounds fish make and their significance in behavior is presented by University of Maryland biologists H. E. Winn, A. Marshall, and B. Hazlett (Copeia, 1964, no. 20, pp. 413-425). Pointed out are the parallels between the development of alarm calls by birds and the alarm call of the squirrelfish, which include: (1) both attractive and dispersive effects on members of the same species; (2) mobbing accompanied by sound; (3) attention and alarm components; (4) differentiation of alarm call; (5) similar calls at dusk and dawn; (6) a different distress, alarm, and territorial aggressive call are developed; and (7) a potential differentiation in fishes, as in birds, of responses to a predator on the bottom and one swimming off the bottom.

Created in 1849, the Department of the Interior—a department of conservation—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR.- FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-3718	- Massachusetts Landings, July 1964, 9 pp.
CFS-3719	- Maryland Landings, November 1964, 4 pp.
CFS-3728	- Fish Sticks, Fish Portions, and Breaded Shrimp, October-December 1964, 3 pp.
CFS-3732	- New Jersey Landings, December 1964, 3 pp.
CFS-3735	- California Landings, October 1964, 4 pp.
CFS-3738	- North Carolina Landings, December 1964, 4 pp.
CFS-3739	- California Landings, November 1964, 4 pp.
CFS-3740	- Frozen Fishery Products, January 1965, 8 pp.
CFS-3741	- Rhode Island Landings, October 1964, 3 pp.
CFS-3742	- Louisiana Landings, December 1964, 3 pp.
CFS-3745	- Maryland Landings, December 1964, 4 pp.
CFS-3746	- Mississippi Landings, November 1964, 3 pp.
CFS-3747	- Alabama Landings, December 1964, 3 pp.
CFS-3748	- New York Landings, December 1964, 4 pp.
CFS-3749	- Shrimp Landings, December 1964, 5 pp.
CFS-3751	- Michigan, Ohio & Wisconsin Landings, November 1964, 4 pp.
CFS-3753	- Maine Landings, December 1964, 4 pp.
CFS-3754	- North Carolina Landings, January 1965, 4 pp.
CFS-3757	- California Landings, December 1964, 4 pp.
CFS-3759	- Mississippi Landings, December 1964, 3 pp.
CFS-3762	- Texas Landings, September 1964, 2 pp.
CFS-3763	- Texas Landings, October 1964, 2 pp.
CFS-3771	- Fish Sticks, Fish Portions, and Breaded Shrimp, 1964 Annual Summary, 4 pp.
CFS-3776	- Packaged Fishery Products, 1964 Annual Summary, 5 pp.

Wholesale Dealers in Fishery Products, 1963 (Revised):

SL-24	- Minnesota (Great Lakes Area), 1963, 1 p.
SL-25	- Wisconsin (Great Lakes Area), 1963, 2 pp.
SL-27	- Indiana (Great Lakes Area), 1963, 1 p.
SL-32	- Minnesota (Mississippi River and Tributaries), 1963, 1 p.

SL-36	- Iowa (Mississippi River and Tributaries), 1963, 2 pp.
SL-37	- Kansas (Mississippi River and Tributaries), 1963, 1 p.
SL-38	- Missouri (Mississippi River and Tributaries), 1963, 2 pp.
SL-40	- Oklahoma (Mississippi River and Tributaries), 1963, 1 p.
SL-42	- Kentucky (Mississippi River and Tributaries), 1963, 1 p.

Sep. No. 732 - Soviet and Japanese Fishing Activity off Alaska in 1964.

Sep. No. 733 - The Trade Expansion Act and the Kennedy Round.

FL-57 - Care of Goldfish, 4 pp., revised Jan. 1965.

SSR-Fish. No. 491 - Monthly Sea-Surface Temperature Anomaly Graphs for Atlantic Coast Stations, by Franklin Stearns, 14 pp., illus., Dec. 1964.

SSR-Fish. No. 494 - Stream Catalog of the Wood River Lake System, Bristol Bay, Alaska, compiled by Richard A. Marriott and others, 219 pp., illus., Oct. 1964.

SSR-Fish. No. 508 - Seasonal Gonadal Cycle of the Male Soft-Shell Clam, *Mya arenaria*, in Maryland, by William N. Shaw, 7 pp., illus., Feb. 1965.

A Device for Stamina Measurement of Fingerling Salmonids, by Allan E. Thomas, Roger E. Burrows, and Harry H. Chenoweth, Research Report 67, 19 pp., illus., printed, 1964.

Effects of Accumulated Excretory Products on Hatchery-Reared Salmonids, by Roger E. Burrows, Research Report 66, 16 pp., illus., printed, 1964.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, RM. 510, 1815 N. FORT MYER DR., ARLINGTON, VA. 22209.

Number	Title
MNL-5	- Denmark's Fishing Industry, 1964, (Supplement), 23 pp.
MNL-14	- United Kingdom's Fishing Industry, 1964, 11 pp.
MNL-98	- A News Service for Europe's Fish Markets, 4 pp.
MNL-99	- The General Agreement on Fisheries and Norway's Current Subsidy System, 13 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE REPORTS ARE AVAILABLE FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF. 90731.

Chapter XII--Tuna Industry Organizations, by Shoichi Masuda, Translation Series No. 14, 11 pp., processed, March 1965. (Translated from the Japanese, Comprehensive View of the (Japanese) Tuna Fishery, March 1963, pp. 803-813.)

Controversy Surrounding the Exporters Agreement on Canned Tuna Exports to the United States, Translation Series No. 15, 24 pp., processed, April 1965. (Translated from the Japanese, Suisan Tsushin Sha, Chiyoda Kaikan, 1-banchi, 2-chome, Kudan, Chiyoda-ku, Tokyo, Japan, Oct. 1, 1964.)

THE FOLLOWING ARE AVAILABLE FROM THE BRANCH OF REPORTS, BUREAU OF COMMERCIAL FISHERIES, U. S. DEPARTMENT OF THE INTERIOR, WASHINGTON, D. C. 20240, DISTRIBUTION LIMITED.

Distribution of Physical-Chemical Properties and Tabulations of Station Data, Washington and British Columbia Coasts, May 1963, by W. James Ingraham, Jr., Data Report 5, 3 microfiche cards, illus., March 1965.

Lake Michigan Chemical Data, 1954-55, 1960-61, by Alfred M. Beeton and James W. Moffett, Data Report 6, 3 microfiche cards, illus., March 1965.

North Pacific and Bering Sea Oceanography, 1960 and 1961, by Betty Ann Morse, Data Report 7, 8 microfiche cards, illus., March 1965.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

FL-575 - Parasites of Freshwater Fishes: IV--Miscellaneous; The Anchor Worm (Lernaea cyprinacea) and Related Species, 4 pp., Jan. 1965. (Eastern Fish Disease Laboratory, U. S. Bureau of Sport Fisheries and Wildlife, Leetown, Post Office Kearneysville, W. Va. 25430.)

California Fishery Market News Monthly Summary, Part I - Fishery Products Production and Market Data, Feb. 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif. 90731.) California cannery receipts of tuna and tunalike fish and other species used for canning; pack of canned tuna, tunalike fish, sardines, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; prices for fish meal, oil, and solubles; for the month indicated.

Fishery and Oceanography Translations, no. 4, Jan. 1965, 51 pp., processed. (Translation Program, Branch of Reports, U. S. Bureau of Commercial Fisheries, 2725 Montlake Blvd. E., Seattle, Wash. 98102.)

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, Jan. 1965, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; Gulf menhaden landings and production of meal, solubles, and oil; fishery imports at Mobile, Ala., Morgan City and New Orleans, La., Miami, Fla., and Houston, Port Isabel, and Brownsville, Tex.; and sponge sales; for the month indicated.

Informational Guide for the Chicago Daily "Fishery Products Reports", 5 pp., 1965. (Market News Service, U. S. Fish and Wildlife Service, Rm. 704, 610 S. Canal St., Chicago, Ill. 60607.) Information to aid subscribers in interpreting the contents of the Chicago daily "Fishery Products Reports." Items covered include terms for receipts, landings, prices, cold-storage movement and holdings, imports, market trends and developments, and other explanatory information concerning the data as presented in the reports.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, Feb. 1965, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, Jan. 1965, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, and Provincetown), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--Dec. 1964, 20 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Seattle--Landings, Receipts, and Value of Fishery Products, 1964, by Charles M. Reardon, 38 pp., March 31, 1965. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Reviews Pacific Northwest fisheries trends and their effect on Seattle fishery receipts for 1964. Contains statistical tables on landings by U. S. halibut fleet; Seattle's landings and receipts of fishery products, by months; carload and truckload shipments of fishery products by months; imports of canned fishery products; receipts of Alaska canned fish and shellfish; and names, classifications, and approximate standards as used on Seattle Wholesale Market. Also presents data on receipts of fresh and frozen fish and shellfish; fresh and frozen salmon receipts and imports; ex-vessel landings and prices of fish by the otter-trawl fleet; Puget Sound canned salmon pack; and related information.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ACCLIMATIZATION:

"A discussion of the problems of acclimatization of fishes and their food," by B. G. Loganzen, article, Breeding, Population Dynamics and Health of Fish, OTS 64-31188, printed, 1964, \$1.50. (Translated from the Russian, Voprosy Ikhtologii, vol. 4, no. 1, 1964, pp. 196-197. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

ALASKA:

A Market Research Study for a Proposed Alaska Bottomfish Industry, 110 pp., illus., processed, Feb. 1965, 55 cents. Area Redevelopment Administration, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Reports on a market research survey for a projected Alaska bottomfish industry, to determine the extent to which the products of processed Alaska bottomfish would be able to enter present markets, competitively, and provide estimates of the long-range potential of such products. A section on assessment of the Northeast Pacific bottomfish resource discusses the extent and availability of flatfish species, and the nature and distribution of present fishing effort. Another section on delineation of potential markets covers potentially important commercial markets, state and condition in which fish are marketed, present domestic and foreign suppliers of bottomfish, the potential by species and market, and projection of long-range market trends. A short chapter on possibilities of fish meal as a byproduct of the bottomfish industry is included. The final chapter, presenting consideration of the economic feasibility of an Alaska bottomfish fishery, explains wage and processing considerations; marketing, distribution, and promotion problems; pricing considerations; and management and flexibility of operation. The authors conclude that unless a proposed Alaska bottomfishery uses more efficient vessels and gear than the present West Coast industry, unless it employs more modern processing and distribution methods, unless it avoids the technical shortcomings characteristic of the bottomfish industries on both East and West Coasts, it cannot expect to approach economic viability.

ALGAE:

An Introductory Account of the Smaller Algae of British Coastal Waters. Part V--Bacillariophyceae (Diatoms), by N. Ingram Hendey, Fishery Investigations Series IV, printed, 1964, 182s. 6d. (about US\$36.50 when ordered in the United States). Ministry of Agriculture, Fisheries and Food, London, England. (Available from the British Information Services, 845 Third Ave., New York, N. Y. 10022.)

ANCHOVY:

"Asombroso! Desembarcamos 8,700,000 toneladas" (Wonderful! We land 8,700,000 metric tons), article, Mundo Pesquero, vol. 2, no. 16, Dec. 1964, pp. 6-8, 42, illus., printed in Spanish, single copy 10 soles (about 40 U. S. cents). Editoriales Unidas S. A., Av. Mariscal Benavides 1207, Lima, Peru.

"La pesqueria de la Anchoveta" (The anchovy fishery), article, Informe, vol. 1, no. 1, 1965, pp. 1-15, illus., processed in Spanish. Biblioteca, Instituto del Mar del Peru, Apartado 3734, Lima, Peru.

ANTIOXIDANTS:

"Antioxidantes" (Antioxidants), article, Mundo Pesquero, vol. 2, no. 16, Dec. 1964, pp. 13-15, illus., printed in Spanish, single copy 10 soles (about 40 U. S. cents). Editoriales Unidas S. A., Av. Mariscal Benavides 1207, Lima, Peru. Discusses research being conducted in Peru on the effectiveness of three antioxidants in stabilizing fish flour, maintaining its freshness, preventing oxidation and subsequent loss of nutritive value, and eliminating spontaneous combustion.

ARGENTINA:

Following reports in Spanish available from Direccion General de Pesca y Conservacion de la Fauna, Secretaria de Estado de Agricultura y Ganaderia de la Nacion, Buenos Aires, Argentina:

Almejas Nacaríferas de la Republica Argentina, Genero DIPLODON (Moll. Mutelidos) (Fresh-Water Mussels of the Republic of Argentina, Genus Diplodon--Mollusca Mutelidae), by Zulma J. Ageitos de Castellanos, Publicacion Miscelanea No. 421, 40 pp., illus., 1960.

Contribución al Estudio Bioeconómico de las Especies de Almejas Nacaríferas del Río Parana (Contribution to the Bioeconomic Study of the Fresh-Water Mussels of the Parana River), by Oscar A. Canzio, 34 pp., illus., 1960.

ATOMIC ENERGY COMMISSION:

Annual Report to Congress of the Atomic Energy Commission for 1964, 89th Congress, 1st Session, Senate Document No. 8, 450 pp., illus., printed, Jan. 1965. U. S. Atomic Energy Commission, Washington, D. C. 20545. A short section deals with radiation preservation of food (includes fishery products) preservation factors, acceptability factors, wholesomeness and public health safety, packaging, and irradiators. Shown is a schematic drawing of a fishery products irradiator.

AUSTRALIA:

Fishing and Whaling, Australia, 1963-64, Statistical Bulletin No. 10, 25 pp., illus., processed, March 9, 1965. Commonwealth Bureau of Census and Statistics, Canberra, Australia. This is the tenth of a series of annual statistical bulletins dealing with the fishing and whaling industry. Statistics relate to the year 1963/64 for general fisheries, the 1963 season for pearl shell and trochus shell fisheries, and the 1964 season for whaling, with comparative data for the previous four years. Exports and imports of fish products, unmanufactured shells, and marine-animal oils are shown for 1963/64 together with comparable figures for the previous two years. The bulletin is divided into four parts. Part I deals with general fisheries including those for fish, crustaceans, and molluscs (edible products). Part II includes fisheries for pearl shell and trochus shell (inedible products). Part III covers the operations of the whaling industry in Australia and Norfolk Island. Part IV shows particulars of overseas trade in the products of fishing and whaling.

BRAZIL:

Sudene, Boletim de Estudos de Pesca, vol. 3, no. 8, Aug. 1963, 21 pp., processed in Portuguese. Depart-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

amento de Industrializacao, Divisao de Pesca, Superintendencia do Desenvolvimento do Nordeste, Edificio Juscelino Kubitschek, 12º Andar, Recife, Pernambuco, Brazil. Includes, among others, articles on: "Novos horizontes de Pesca no Atlântico Sul" (New horizons in the South Atlantic fishery); "Caca de baleias no Nordeste: 1963 (Jun/Jul)" (Whaling season in the Northeast, 1963--June/July), by Bento F. Grangeiro; "Métodos de beneficiamento de langostas" (Method of improving spiny lobsters), by A. R. Prater and W. A. Montgomery; and "Pescarias experimentais de lagosta no Panamá" (Experimental lobster fishery in Panama), by Harvey R. Bullis, Jr.

CALIFORNIA:

The California Marine Fish Catch for 1963, Fish Bulletin 129, 45 pp., illus., printed, 1965. Office of State Printing, Documents Section, P. O. Box 1612, Sacramento, Calif. 95807. A summary of the 1963 landings of the California commercial fishing fleet, the imports from other states or foreign countries of fresh fish received for processing, the catches of the party boat fleet, and poundages of inshore bait handled during the year. Statistical data cover landings and shipments of leading species, by weight and value; annual landings and shipments, 1916 through 1963; number of licensed commercial fishermen; number of registered fishing vessels by length; and origin of shipments, 1963. Also included are data on origin of commercial fish landings, 1963; monthly landings and shipments, 1963, by areas and statewide; value and poundage, annual landings and shipments by areas, 1963; value of landings and shipments by ports and areas, 1963; party boat sport catch, 1954-63; and live bait catch, 1963.

Marine Baits of California, by Charles H. Turner and Jeremy C. Sexsmith, 71 pp., illus., printed, May 1964. Department of Fish and Game, 1416 Ninth St., Sacramento, Calif. 95814.

CANADA:

Costs and Earnings of Selected Fishing Enterprises, Atlantic Provinces, 1962, by John Proskie, Primary Industry Studies No. 1, vol. 12, 144 pp., illus., processed, 1964. Economics Service, Department of Fisheries of Canada, Ottawa, Canada. This is an annual progress report on a study of the economics of 137 primary fishing enterprises. They are grouped in 19 classes according to region and type and size of fishing craft and gear employed. In the first part, the findings for the 1962 season are examined and discussed. The second part includes detailed tables summarizing the fishing activities and financial results for the fishing enterprises included in the 1962 phase of the study. The study in 1962 was extended to include for the first time a sample of Nova Scotia 97-foot scallop draggers and 115-foot wooden otter trawlers.

Following are available from Queen's Printer and Controller of Stationery, Ottawa, Canada.:

Fisheries Statistics, British Columbia, 1963, Catalogue No. 24-208, 17 pp., illus., processed in French and English, March 1965, 50 Canadian cents. Presents data on the quantity and value of fishery products by species, 1951-63; quantity and value by species and fisheries districts, 1962-63; capital equip-

ment employed in primary fisheries operations; and number of persons engaged in primary fisheries operations.

Journal of the Fisheries Research Board of Canada, vol. 22, no. 1, Jan. 1965, 254 pp., illus., printed, single copy C\$2. Contains, among others, these articles: "Effects of salting and smoking on protein quality of cod," by I. C. Munro and A. B. Morrison; "Some methods for estimating ocean mortality of Pacific salmon and applications," by R. A. Fredin; "Effect of polyphosphates and other salts on drip loss and oxidative rancidity of frozen fish," by J. W. Boyd and B. A. Southcott; "Reproduction of king crabs, *Paralithodes camtschatica* (Tilesius)," by Guy C. Powell and Richard B. Nickerson; "Tetracycline antibiotics in shrimp preservation," by B. A. Southcott and J. W. Boyd; "Lipids and component fatty acids of the Newfoundland squid, *Illex illecebrosus* (Le Sueur)," by Peter M. Jangaard and R. G. Ackman; "*Lampetra richardsoni*, a new nonparasitic species of lamprey (Petromyzonidae) from western North America," by Vadim D. Vladykov and W. I. Follett; "Significance of early emergence, environmental rearing capacity, and behavioral ecology of juvenile coho salmon in stream channels," by J. C. Mason and D. W. Chapman; and "Northern range extensions for four species of rockfish (*Sebastes goodei*, *S. helvomaculatus*, *S. rubrivinctus*, and *S. zacentrus*) in the North Pacific Ocean," by S. J. Westrheim.

34th Annual Report, 1963, Department of Fisheries, Catalogue No. Fs 1-1963, 137 pp., illus., printed, 1964, C\$1.25. Presents the functions and activities of the Department of Fisheries for the year 1963, and the financial statement of the Department for the fiscal year 1963/64. Covers in detail the activities of the Protection Branch's patrol vessels; and those of the Conservation and Development, Inspection, Economics, Information and Consumer, and Industrial Development Services. Also covers the Fishermen's Indemnity Plan, Fisheries Prices Support Board, the Fisheries Research Board of Canada, international commissions, and special committees. Canada's Pacific and Atlantic Coast and inland fisheries are also discussed. Statistics cover the quantity and value of fish and shellfish landed, by areas and species and by areas and provinces; exports by types of products and countries of destination; number of fishermen in Canada; and value of fishing craft by areas. The appendix contains financial statements for the fiscal year 1963/64, and statements on fish-culture developments.

CANNING:

"A practical method for canning freshwater fish," by A. W. Lantz, article, *Trade News*, vol. 17, no. 8, Feb. 1965, pp. 3-8, illus., processed, Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

COD:

"Protein denaturation in frozen fish. IX--The inhibitory effect of glycerol in cod muscle," by R. M. Love and M. K. Elerian, article, *Journal of the Science of Food and Agriculture*, vol. 16, no. 2, Feb. 1965, pp. 65-70, illus., printed, single copy £1 17s. (about US\$5.20). Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

COMPOSITION:

"Lipids and protein denaturation in fish muscle," by June Olley and W. R. H. Duncan, article, *Journal of the Science of Food and Agriculture*, vol. 16, no. 2, Feb. 1965, pp. 99-104, printed, single copy £1 17s. (about US\$5.20), Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

CRABS:

"Blackening of the outer surface of tins of canned crab," by V. S. Gordievskaya, article, *Trudy Dalrybvtsu*, vol. 3, 1963, pp. 157-165, printed in Russian, *Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khoziaistva*, Vladivostok, U.S.S.R.

DENMARK:

"865 millioner kg. fisk ul 546 millioner kroner fanget af Danske fiskere i 1964" (865 million kg. of fish worth 546 million kroner landed by Danish fishermen in 1964), article, *Dansk Fiskeritidende*, vol. 82, no. 8, Feb. 19, 1965, pp. 92-94, illus., printed in Danish, *Dansk Fiskeritidende*, Studiestraede 3, 2, Copenhagen K, Denmark.

Fisheries' Equipment and Fish Processing Machinery from Denmark, 106 pp., illus., printed (Spanish edition also available), 1965. The Federation of Danish Industries, 18 H. C. Andersens Blvd., Copenhagen, Denmark. This booklet presents descriptions and illustrations of products and processes of 43 Danish firms manufacturing fisheries equipment for export. Some of the categories are fishing vessels, engines and propellers, navigating equipment, nets and cordage, freshwater generators, fish meal and oil equipment, freeze-driers, refrigerating and freezing equipment, food processing machinery, conveyor plants, and refrigerated trucks and containers. Also includes a list of the firms represented.

DOGFISH:

"The characterization of collagen from the skin of the dogfish shark, *Squalus acanthias*," by Marc S. Lewis and Karl A. Piez, article, *Journal of Biological Chemistry*, vol. 239, Oct. 1964, pp. 3336-3340, printed, Williams and Wilkins Co., Mount Royal and Guilford Aves., Baltimore 2, Md.

EELS:

Historia de una Angula que se Convertio en Anguila (Story of a Larva Which Was Changed into An Eel), by Jose Ma. Navaz y Sanz, 40 pp., illus., printed, 1964. Sociedad de Oceanografia de Guipúzcoa, San Sebastian, Spain.

ETHIOPIA:

Report on the Fisheries in Ethiopia, by M'nakhem Ben-Yami, 117 pp., illus., processed, 1964. Department for International Cooperation, Ministry for Foreign Affairs, State of Israel, Jerusalem, Israel. Presents the results of a survey of Ethiopia's marine and fresh-water fisheries conducted between Oct. 1960 and July 1963. Covers the resources of the Ethiopian waters of the Red Sea, the fresh fish industry, other marine products of commerce such as shells and pearls, motorization of fishing craft, the Ethiopian fisheries administration, and the Lake Tana fishery. Recommendations include establishment of a Fisheries Division, fisheries boards, and cooperatives; provision in the Five-Year Plan for improved marketing; training of fishermen and edu-

cation for their children; a fishing harbor project; experimental fishing; motorization of native craft; development of the fish meal industry; increasing the demand for fresh fish; and production of fresh and canned catfish from Lake Tana.

FISH DETECTION:

The Relation of the Intensity of the Echo-Signal to the Duration of the Impulse, by E. V. Shishkova, *Translations (New Series)* No. 32, 4 pp., printed, 1964. (Translated from the Russian, *Rybnoe Khoziaistvo*, no. 1, 1962, pp. 37-40.) Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, Suffolk, England.

FISH MEAL:

"The nitrogen metabolism of the young pig. II--Effect of heat treatment on the 'available' lysine content of fish meal and the performance of pigs," by A. A. Jones and A. Cadenhead, article, *Journal of the Science of Food and Agriculture*, vol. 16, no. 1, Jan. 1965, pp. 38-42, printed, single copy £1 17s. 6d. (about US\$5.27), Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.

"Use of chick plasma non-protein nitrogen in evaluating fish meals," by G. R. Childs and G. F. Combs, article, *Poultry Science*, vol. 43, Sept. 1964, pp. 1220-1222, printed. Poultry Science Association, Kansas State College, Manhattan, Kans.

FISH OIL:

The following are from *Chemical Abstracts*, vol. 59, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Edible oil from marine oil," by Seiji Okami, Eiji Negoro, and Hisatake Sato, Oct. 28, 1963, Abstract No. 10354a.

"Fish oils from fish caught in the Inland Sea of Japan, I--Oils from *Harengula zunasi*, *saurida* and halfbeak," by Seiichi Ueno and Shigeru Hamada, July 8, 1963, Abstract No. 846a.

"Reaction mechanism of antioxidant in marine products. I--Relation between the efficacy of antioxidant and the unsaturation degree of fish oil," by Kenzo Toyama, Nov. 11, 1963, Abstract No. 12090d.

FISH POISONING:

Fish Poisoning along the North Eastern Coast of Tanganyika, by C. S. Alexander, 4 pp., printed, 1964. (Reprinted from *Tanganyika Notes and Records*, vol. 62, March 1964.) University of Illinois, Urbana, Ill.

FISH PROTEIN CONCENTRATE:

"Fish flour (fish protein concentrate) controversy nearing solution," article, *Food Processing*, vol. 25, Oct. 1964, pp. 21-22, printed, Putnam Publishing Company, 111 E. Delaware Pl., Chicago 11, Ill.

"Measurement of oxygen absorption by fish flours. Stabilization by antioxidants," by J. F. Flanz, G. Rocquelin, and Andree Pihet, article, *Chemical Abstracts*, vol. 59, Sept. 30, 1963, Abstract No. 8050g, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

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FISH SOLUBLES:

"Crystalline growth factors isolated from fish solubles," article, Feedstuffs, vol. 36, Sept. 19, 1964, p. 39, printed. Miller Publishing Co., 2501 Wayzata Blvd., Minneapolis 5, Minn.

"Studies of the growth-promoting activity for chicks of fish solubles," by G. F. Harrison and M. E. Coates, article, British Journal of Nutrition, vol. 18, no. 3, 1964, pp. 461-466, printed. Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

FOOD AND AGRICULTURE ORGANIZATION:

Yearbook of Fishery Statistics, 1963 (Catches and Landings), vol. 16, 367 pp., illus., processed in French, Spanish, and English, 1964, \$4.50. Food and Agriculture Organization of the United Nations, Rome, Italy. (Available from Columbia University Press, International Documents Service, 2690 Broadway, New York, N. Y. 10027.) Beginning with this edition, two volumes of the Yearbook are published annually. This volume, subtitled "Catches and Landings," reports data on quantities and values of fish, shellfish, and plants landed and harvested by countries, by species, and by fishing areas. The other volume, subtitled "Fishery Commodities" covers disposition of the catches and both production and international trade data by types of fishery commodities. The tables in this volume are arranged in three sections. The first section contains statistical tables on summaries of catches by continents and by countries; by species; and by major fishing areas. The second section has data on catches by individual countries. The final section includes data on catches by species under the categories of fresh-water and diadromous fish, marine fish, shellfish, whales, seals and other marine mammals, aquatic animals and residues, and aquatic plants.

FRANCE:

"Au Pardon des Terre-Neuvas de Fecamp M. Jean Morin évoque les problèmes de la grande pêche et de l'armement hauturier" (At the pilgrimage of the Newfoundland fishermen at Fecamp, Mr. Jean Morin discusses the problems of the marine fishery and distant-water vessels), article, La Pêche Maritime, vol. 44, no. 1043, Feb. 1965, pp. 77-81, 82, printed in French, single copy 14 F (about US\$2.85). La Pêche Maritime, 190, Blvd. Haussmann, Paris, France.

The following articles are from France Pêche, no. 91, Jan. 1965, printed in French, single copy 2.50 F (about 50 U. S. cents). France Pêche, Boite Postale 179, Lorient, France:

"L'Institut Scientifique et Technique des Pêche Maritimes" (The Scientific and Technical Institute of Marine Fisheries), by Jean Furnestin, pp. 4-7, illus.

"A Nice: vente sans crie" (at Nice--sale without auction), by Y. Le Berre, pp. 8-11, illus. Discusses an agreement and a contract between the fish salesmen and the fishermen-owners.

FREEZE-DRYING:

"Thermal conductivity of some freeze-dried fish," by Graham Lusk, Marcus Karel, and Samuel A.

Goldblith, article, Food Technology, vol. 18, Oct. 1964, pp. 121-124, printed, single copy \$1.50. The Garrard Press, 510 N. Hickory, Champaign, Ill. 61823.

FRENCH POLYNESIA:

"Fisheries development in French Polynesia," by Louis Devambe, article, South Pacific Bulletin, vol. 15, no. 1, Jan. 1965, p. 36, illus., printed, single copy 30 cents. South Pacific Commission Publications Bureau, G. P. O. Box 5254, Sydney, Australia.

FROZEN FISH:

"Preventive effect of polyphosphate on the drip formation of the thawed fish flesh," by Fuyuo Ota and Junichi Nishimoto, article, Chemical Abstracts, vol. 61, July 6, 1964, Abstract No. 1178d, printed. American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

GALA PAGOS ISLANDS:

"Apuntes e informaciones sobre las pesquerías en el Archipiélago de Colon (Islas Galápagos) (Memoranda and information on the fisheries of the Columbus Archipelago--Galapagos Islands)," by Domingo Quiroga and Anibal Orbes Armas, article, Boletín Informativo, vol. 1, no. 5, 1964, pp. 1-18, illus., printed in Spanish. Biblioteca, Instituto Nacional de Pesca del Ecuador, Casilla 5918, Guayaquil, Ecuador.

GEAR:

"Theory of catching ability and the classification of commercial fishing gear," by V. N. Voinikanis-Mirskii, article, Trudy Dalrybvtus, vol. 3, 1963, pp. 29-40, printed in Russian. Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khozyaistva, Vladivostok, U.S.S.R.

GENERAL:

Journal du Conseil, vol. 29, no. 2, Oct. 1964, 110 pp., illus., printed, Kr. 16 (about US\$2.35). Andr. Fred. Høst & Son, Bredgade, Copenhagen, Denmark. Contains, among others, articles on: "The duration of maturation stages of herring," by T. D. Iles; "Racial studies on Manx herring stocks," by D. J. Symonds; "A direct method for determining the pumping rate of siphonate bivalves," by John Coughlan and Alan D. Ansell; "Some parameters of growth of mature *Venus mercenaria* L.," by Alan D. Ansell; and "The spawning and fecundity of the Norway lobsters (*Nephrops norvegicus* L.) around the Scottish coast," by H. J. Thomas.

Wondrous World of Fishes, Editor-in-Chief Melville Bell Grosvenor, 367 pp., illus., printed, 1965, \$8.75 postpaid anywhere in the world. National Geographic Society, 17th and M Sts. NW., Washington, D. C. 20036. With the greater emphasis that is being placed today on the importance of oceanography and the effect it will have on each and everyone of us in the near future, it behooves us to learn something about our watery world and the creatures that inhabit it. This book has made it easy. It reveals the fascinating and still-mysterious lives and haunts of 340 species of fish and shellfish found in and around North America and Hawaii. With more than 400 illustrations (371 in superb color), the sea and its creatures are brought right into your living room. The Society's technique of lifelike color photographs (now more realistic than ever because of the great

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progress made in underwater photography) brings the book to life. You actually travel deep into the



One of the 371 color photographs appearing in the book, Wonderous World of Fishes.

realm where man still is an intruder. Dr. Leonard P. Schultz, curator of the Smithsonian Institution's Division of Fishes, served as scientific consultant for the book, and a large number of others contributed to the book. In the opening chapter, Dr. Schultz reveals a wealth of curious facts about fish and answers many questions. What is a fish? Do fish make noise? Do fish have external ears? Do fish sleep? Do fish drink water? Revealed are other facts: fish have rings on scales that tell age; some fish set up "cleaning stations"; the angler-

fish lures its victims with "bait." In 20 chapters the book gives a close-up view of the creatures that inhabit the waters that make up the greatest part of our world. Divided into four major parts, the first one concentrates on fishing for fun. Chapters in this part take you angling in the United States, ice fishing, tarpon fishing, fishing for devilfish in the Gulf Stream. Coast and deep-sea fish are covered in the second part, and the chapters deal with fishing on the North Atlantic Grand Banks, America's first park in the sea, Florida's underwater wonderland, and the nation's major oceanariums. The third part discusses lake and stream dwellers and includes a look at West Coast streams together with the salmon and sturgeon that inhabit them; the story of the fight to save the golden trout or sunapee in a New Hampshire lake; and a look-see at aquarium fish (America's most numerous pets) which lure fortune hunters to the far corners of the world. The fourth and last major part of the book is titled "Warm-water Curiosities." The chapters in this part point up the fascination of the book: "Miracle of the Mermaid's Purse"; "Little Horses of the Sea"; and "Solving Life Secrets of the Sailfish." Each of the four parts concludes with a gallery of the species of fish pertinent to that particular part--(1) marine game fish, (2) marine nongame or commercial fish, (3) fresh-water fish, and (4) sharks and Hawaiian fish--with life histories, illustrated with photographs and paintings in brilliant, living color. One of the book's chapters points up vividly the freedom of photographers in taking pictures under water. The photographer responsible for that chapter, Jerry Greenberg, describes two months of roaming the waters of the John Pennekamp Coral Reef State Park off Florida's east coast. At a distance of only seven feet he photographed a 10-foot lemon shark eating a snapper. Chapter 20 is a "Guide to Fish Cookery" by that world-renowned gourmet James A. Beard. Besides a good index, there is also a listing of aquariums open to the public. If you are a hobbyist, a student, a biologist, an angler, a scientist, a businessman, a cook or gourmet, or just someone who has an interest in the world around you, this book will be a constant companion.

--Joseph Pileggi

GERMAN DEMOCRATIC REPUBLIC:

Fish Catch of the GDR to be More Than Doubled by 1970, JPRS 27932, 7 pp., processed. (Translated from the German, *Seeverkehr*, vol. 4, no. 10, 1964, pp. 546-550.) Office of Technical Services, U. S. Department of Commerce, Bldg. Tempo E, E. Adams Dr., 4th and 6th Sts. SW., Washington, D. C. 20443.

Gesammelte Sonderdrucke aus dem Institut für Hydrobiologie und Fischereiwissenschaft der Universität Hamburg 1963 (Collected Reprints from the Institute for Hydrobiology and Fisheries Science of the University of Hamburg, 1963), 127 pp., illus., printed in German or English, 1964. Institut für Hydrobiologie und Fischereiwissenschaft, Universität Hamburg, Olbersweg 24, 2 Hamburg-Altona 1, Federal Republic of Germany. Includes, among others, articles on: "Das neue Institut für Hydrobiologie und Fischereiwissenschaft der Universität Hamburg und seine geschichte" (The new Institute for Hydrobiology and Fisheries Science of the University of Hamburg and its history), by A. Buckmann; "Fisheries research and international collaboration," by C. E. Lucas; "Some comments on scientific procedure in herring investigations," by A. Buckmann; "The causes of changes in recruitment, Herring Symposium 1962, Annex II," by G. Hempel; "On the condition of herring larvae," and "The influence of egg size on herring larvae (*Clupea harengus* L.)," by J. H. S. Blaxter and G. Hempel; "Die auswirkung der kanalisierung unserer flüsse auf die fischfauna und ihre lebensbedingungen" (The effect of the canalization of our rivers on fishes and their environment), and "Probleme der fischereilichen Nutzung kanalisierter flüsse" (Use of canalized rivers for fishing), by K. Lillelund.

HAKE:

La Pesca de la Merluza en el Mar Argentino, durante el Año 1963. Areas de Captura y Rendimientos (The Hake Fishery in the Sea Off Argentina during 1963, Areas of Capture and Yield), by Luis R. Vasquez and others, 22 pp., illus., processed in Spanish, 1964. Direccion General de Pesca y Conservacion de la Fauna, Secretaria de Estado de Agricultura y Ganaderia, Buenos Aires, Argentina.

HERRING:

On the Occurrence of Thiaminase in Baltic Herring, by Taina Kuusi, Tiedotus, Sarja IV, Kemia 52, 14 pp., printed, 1963. Valtion Teknillinen Tutkimuslaitos, Helsinki, Finland. Describes experiments to determine the quantity of thiaminase, an enzyme which destroys vitamin B₁, present in frozen Baltic herring, fresh bream, and ensilaged Baltic herring. Only the gills and viscera were used and it was found that thiaminase activity occurs in Baltic herring, although it is not nearly so high as in bream. However, ensiling with acid evidently inactivates the thiaminase of the fish.

The following articles are from *Trudy BaltNIRO*, vol. 9, 1962, printed in Russian. Baltiiskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Kaliningrad, U.S.S.R.:

"Biology and Stocks of herring of the Nova Scotia shelf," by I. G. Fridlyand, A. F. Erokhin, and M. P. Yakovchuk, pp. 88-122.

"Rate of maturation in herring from Georges Bank in July-August 1961," by V. I. Sauskan, pp. 158-159.

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INDUSTRIAL PRODUCTS:

"Study of improved recovery of protein from rendering-plant raw materials and products. I--Liquid cyclone separation with carbon tetrachloride; II--Acid and enzyme hydrolysis," by L. G. Criswell and others, articles, *Food Technology*, vol. 18, Sept. 1964, pp. 243-251, printed, single copy \$1.50. The Garrard Press, 510 N. Hickory, Champaign, Ill. 61823.

INTERNATIONAL COMMISSIONS:

(International North Pacific Fisheries Commission) Proceedings of the Eleventh Annual Meeting, 1964, 306 pp., illus., processed, March 8, 1965. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada. Presents the minutes of sessions and committee reports of the meeting held at Tokyo, November 16-21, 1964. Includes reports of the Committee on Biology and Research--subcommittees on sockeye salmon, pink salmon, chum salmon, coho and chinook salmon, oceanography, Bering Sea groundfish, king crab research and planning, editorial matters, and research plans. Also contains reports of the committees on finance and administration, Gulf of Alaska groundfish, and abstention.

INTERNATIONAL TRADE:

Report of the FAO/OIE/WHO Meeting on Basic Principles for the Control of International Traffic of Animals and Animal Products, Berne, Switzerland, 12-17 October 1964, Meeting Report AN 1964/79, 30 pp., processed. Animal Health Branch, Animal Production and Health Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. A section on standardization and harmonization of regulations or criteria for fish and fisheries products covers a review and discussion of the problems connected with the hygienic inspection of fishery products for human or animal consumption as well as with international traffic in live fish and fish eggs for breeding, stocking, and ornamental purposes.

IRRADIATION PRESERVATION:

"The influence of gamma-radiation on semi-preserved fish products," by K. Abrahamsson, article, *Iva Meddelande*, vol. 138, pp. 83-84, printed. Iva, s Upplysningstjänst, Box 5073, Stockholm 5, Sweden. Second Scandinavian meeting on food preservation by ionizing radiation, Stockholm, Sept. 9-11, 1963.

JAPAN:

Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, vol. 5, no. 2, December 1964, 283 pp., illus., articles printed in German, Japanese, or English. The Faculty of Fisheries and Animal Husbandry, Hiroshima University, Fukuyama, Japan. Includes, among others, articles on: "On eleven new species of the Cephalopoda from Japan, including two new genera of Octopodinae," by Iwao Taki; and "Note on the fishing condition of the common octopus, *Octopus vulgaris* Cuvier, in the Inland Sea of Seto, Japan," by Sadaichi Nishikawa.

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 13, no. 39, Dec. 1964, 114 pp., illus., printed in Japanese with English abstracts (some articles in English). The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Contains,

among others, articles on: "Notes on the first stage Phyllosoma of Scyllarid lobster, *Scylleris bicuspidatus*," by Toshio Saisho; "Topographical consideration on the shallow water fishing ground inside bay, I," by Koji Nozawa; "On the utility of some algae as agar source in the Southern Sea of Kyushu," by Fuyuo Ohta and Takeshi Tanaka; "Effect of lipids on insolubilization of protein in frozen fish muscle during storage," by Fuyuo Ohta and Jun-ichi Nishimoto; "Distribution of vitamin B₁₂ in the laver-farm," by Ken-ichi Kashiwada, Akio Kanazawa, and Ichiro Sasaki; "Chemical studies on volatile constituents of algae. XX--Pharmacological action of volatile constituents and biochemical significance of the existence of acrylic acid," by Teruhisa Katayama; "Studies on the drag net. I--An increase of the current velocity inside the net," by Nobio Higo; "On the relation between the 'horizontal tuna long-line form' and the spot foretelling of the fishing condition in the Celebes Sea," by Tomio Henmi; and "Experimental studies on the eating reaction of fishes to each hook in the small long-line gear. I--On the results of experiments by 5-hook gear," by Tomokazu Morita.

Following reports in Japanese are available from the Japanese Fisheries Agency, Ministry of Agriculture and Forestry, 2-1, Kasumigaseki, Chiyoda-ku, Tokyo, Japan,:

General Situation of Fishing Vessel Insurance for FY 1964 (as of End of 1964), 116 pp. Consists of tables showing number of powered and nonpowered vessels by size and region covered by insurance, insured amount, insurance premium, etc., and amount subsidized by Japanese Government.

Measures Planned for Implementation for the Coastal Fisheries in 1965, 33 pp. "White Paper" for Diet.

1964 Annual Report on Fisheries Trends. Part 1--Report on Fisheries Trends; Part 2--Report on Measures Implemented for the Coastal Fisheries, 147 pp. "White Paper" on Japan's fisheries prepared for submission to the 48th (Regular) Diet Session.

Following reports in Japanese are available from the Resources Research Council, Science and Technology Agency, 2-2, Kasumigaseki, Chiyoda-ku, Tokyo, Japan:

Recommendations Concerning Modernization of Food Distribution Structure for a Systematic Improvement of Dietary Life, Recommendation No. 15, 20 pp., Jan. 26, 1965.

Appended Data, 510 pp., Jan. 26, 1965.

LATIN AMERICA:

"Latin America's fiskerier utbygges i raskt tempo" (Latin America's fisheries being developed quickly), by Rolf M. Hjelseth, article, *Tidsskrift for Hermetikindustri*, vol. 51, no. 1, Jan. 1965, pp. 32-33, printed in Norwegian. Norske Hermetikfabrikers Landsforening, Stavanger, Norway.

LAW OF THE SEA:

Law of the Sea--Convention on the Territorial Sea and the Contiguous Zone Between the United States of America and Other Governments--Done at Geneva April 29, 1958, Treaties and Other International Acts

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Series 5639, 70 pp., printed, 1964, 25 cents. U. S. Department of State, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) Presents a Presidential Proclamation, including text of the Convention in English, French, Chinese, Russian, and Spanish, concerning the territorial sea and contiguous zone. Part I of the Convention covers the territorial sea--definition and extent of sovereignty; limits of the territorial sea; and right of innocent passage including rules applicable to all ships, rules applicable to merchant ships, to government ships other than warships, and to warships. Part II concerns the contiguous zone, which may not extend beyond 12 miles from the baseline from which the breadth of the territorial sea is measured. Part III covers the final articles--provisions for signature, ratification, accession, and other matters. Included are signatures to the Convention by the United States and 43 other nations.

LIVESTOCK NUTRITION:

"Nitrogen retention by cattle given all-concentrate diets containing different concentrations of fish meal," by H. B. Bowers and others, article, Proceedings of the Nutrition Society, vol. 23, no. 2, 1964, pp. 31-32, printed. Cambridge University Press, 32 E. 57th St., New York, N. Y. 10022.

LOBSTERS:

The Case for Lobster Conservation, 8 pp., illus., printed (French version also available), 1964. Queen's Printer and Controller of Stationery, Ottawa, Canada. The key to conservation and proper management is through cooperation, which can only result from a well-informed, reasonable attitude on the part of all concerned--governments, fishermen, and the fish processing industry. This booklet provides information which will enable lobstermen to understand why they should obey the present Canadian regulations. Points out these favorable results of the regulations: size limits guarantee that some lobsters remain on the grounds and increase the average size of legally marketed lobsters, which bring higher prices; small lobsters returned to the water soon grow to a more profitable size in the same locality; fishing seasons improve the quality of landed lobsters, reduce some fishing costs, permit the fishermen to fish for other species during the remainder of the year; releasing spawning females increases the hatch; and observation of regulations is the only practical means of maintaining stocks.

Wanted--Alive, Not Dead! by D. G. Wilder, General Series Circular No. 45, 7 pp., illus., printed, Feb. 1965. Biological Station, Fisheries Research Station, St. Andrews, N. B., Canada. A message to lobster fishermen on the proper care and handling of their catch. Of Canada's 45 million pounds of lobsters landed annually, probably 3 million pounds die during storage and shipment. Most of those deaths could be avoided. Suggestions include: (1) handle lobsters carefully as their underparts are easily injured; (2) band both claws quickly with rubber bands; (3) keep lobsters cool and moist; (4) don't chill or freeze them; (5) protect from rain; (6) avoid oil, creosote, bilge; (7) give stored lobsters special care, away from polluted water; (8) pack properly; and (9) cooperate and share greater profits.

NATURAL RESOURCES:

Water Resources Research, vol. 1, no. 1, First Quarter 1965, 146 pp., illus., printed, single copy \$2.50; annual subscription \$3 for AGU members, and \$6 for nonmembers. American Geophysical Union, Suite 506, 1145 19th St. NW., Washington, D. C. 20036. In an effort to bridge the physical and social sciences and so to meet the challenge of the future, this new quarterly journal has been established as essential to a coherent development of all the water sciences. The emphasis will be upon the sciences of water--whether physical, chemical, biological, or social--rather than on water engineering or water projects. It is expected that papers will cover such diverse fields as snow, lakes, floods, hydrology, glaciology, limnology, hydraulics, water law, precipitation, stream flow, soil moisture, sedimentation, ground-water, water quality, water planning, systems analysis, water economics, river morphology, evapotranspiration, and watershed management. Some of the articles in this first issue are: "Criteria for social investment," by Kenneth J. Arrow; "Streamflow from small watersheds on the western slope of the Cascade Range of Oregon," by Jack Rothacher; and "A note on a new method of cost allocation for combined power and water desalination plants," by Joseph Barnea.

NAVIGATION:

"Scheme for the automatic directing of vessels by radio-locating deviation," by I. I. Mishenko, article, Trudy Dalrybytus, vol. 3, 1963, pp. 75-89, printed in Russian. Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khozyaistva, Vladivostok, U.S.S.R.

Available free from the Coast and Geodetic Survey, U. S. Department of Commerce, Washington Science Center, Rockville, Md. 20852.

First Supplement to United States Coast Pilot 7, Pacific Coast--California, Oregon, Washington, and Hawaii, Ninth (June 15, 1963) Edition, 13 pp., printed, Jan. 2, 1965.

Fourth Supplement to United States Coast Pilot 1, Atlantic Coast--Eastport to Cape Cod, Sixth (March 26, 1960) Edition, 20 pp., printed, Jan. 2, 1965.

Second Supplement to United States Coast Pilot 5, Atlantic Coast--Gulf of Mexico, Puerto Rico, and Virgin Islands, Fifth (June 16, 1962) Edition, 17 pp., printed, Jan. 2, 1965.

Third Supplement to United States Coast Pilot 3, Atlantic Coast--Sandy Hook to Cape Henry, Seventh (June 17, 1961) Edition, 18 pp., printed, Jan. 2, 1965.

Third Supplement to United States Coast Pilot 8, Pacific Coast, Alaska--Dixon Entrance to Cape Spencer, Eleventh (Jan. 6, 1962) Edition, 10 pp., printed, Jan. 2, 1965.

OCEANOGRAPHY:

California and the World Ocean, Governor's Conference, 118 pp., printed, 1964, \$7.50. California Museum of Science and Industry, Los Angeles, Calif. (Available from the Office of State Printing, Sacramento, Calif.)

General Oceanography and Long Range Research (Annual Progress Report for July 1963-June 1964), 116

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

pp., printed, Nov. 1, 1964, \$1. Scripps Institution of Oceanography, University of California, La Jolla, Calif. (For sale by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.)

National Oceanographic Program, Fiscal Year 1966, ICO Pamphlet No. 17, 75 pp., printed, Jan. 1965. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington, D. C. 20360. Outlines a coordinated plan for the accomplishment of national goals in oceanography while pursuing individual agency missions. Chapter I presents a summary of the 1966 program, agency responsibilities, and a financial statement; and program goals--strengthening basic science, improving national defense, managing resources in the world ocean, managing resources in domestic waters in order to safeguard public health and conserve resources held in common, and protecting life and property ashore and insuring safety of operations at sea. Chapter II outlines oceanographic effort--research by individual agencies, special programs, oceanographic surveys, data processing facilities and projects, international programs, and cooperative interagency programs. Chapter III, reviewing oceanographic resources, covers ships, instrumentation, facilities, and manpower and training. Appendices include budget tables and an inventory of research/survey vessels in the U. S. oceanographic fleet (including Government and privately-owned vessels).

"Oceanographic ships around the world," edited by Charles W. Covey, article, Undersea Technology, vol. 6, no. 1, Jan. 1965, pp. 35-36, 38-39, 40-41, 42, 44-49, printed, single copy \$1. Compass Publications Inc., 617 Lynn Bldg., 1111 N. 19th St., Arlington, Va. 22209. A condensed tabulation of oceanographic ships showing physical characteristics, equipment, and capabilities to perform oceanographic and marine sciences work. References for operators and owners are also listed. Reported information was obtained from data submitted by ship owners and operators, and the National Oceanographic Data Center. Additional ships will be included in a reprint of this listing based on subsequent information. Copies of that reprint are available at \$1.75 each.

The following articles are from Trudy BaltNIRO, vol. 9, 1962, printed in Russian. Baltiiskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Kaliningrad, U.S.S.R.:

"Relation between the waters and the distribution of (commercial) fishes in the Nova Scotia area," by Yu. A. Vyalov, E. A. Filippov, and E. I. Konovalev, pp. 123-130.

"The scientific fish locating expedition with RT Mukun to the southwestern coast of Africa," by Yu. A. Komarov and S. K. Kuderskii, pp. 3-18.

"Scientific fishery investigations at Malakka and Indonesia in 1960 with the trawler Arsen'ev," by A. N. Probatov, pp. 137-147.

OYSTERS:

"Elemental composition of oyster shell," by R. A. Smith and E. R. Wright, article, Chemical Abstracts, vol. 58, Jan. 28, 1963, Abstract No. 1746f, printed, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006.

PERU:

"Peru nets a boom in fishmeal," article, Business Week, no. 1851, February 20, 1965, pp. 64-65, 67-68, illus., printed, single copy 50 cents. McGraw-Hill, Inc., 330 W. 42nd St., New York, N. Y. 10036.

PESTICIDES:

Fish and Pesticides: A General Statement of FAO Policy, FAO Fisheries Technical Paper No. 45, 7 pp., processed, July 1964. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy.

PHYSIOLOGY:

"Marine biotelemetry," by Howard A. Baldwin, article, Bioscience, vol. 15, no. 2, Feb. 1965, pp. 95-97, illus., printed, single copy \$2. American Institute of Biological Sciences, 1323 Greenwood Rd., Baltimore, Md. 21208. Several experiments involving transmission of physiological information by telemetry from unconfined marine mammals are described. Preliminary data have been obtained to date on depth of dives with seals. The electrocardiograms of several diving mammals are described as well as instruments for body temperature measurement and transmission of acoustic activity in dolphins. A technique for remote control of olfactory stimulants in freely swimming sharks is mentioned. Marine biotelemetry offers an unusual opportunity to conduct experiments in natural environmental backgrounds that should lead to a fuller understanding of the sensory and regulatory physiology of animal life. It should also give researchers the ability to monitor aquatic microenvironments of living systems without disturbing those characteristics which may be important.

PORTUGAL:

The following articles are from Jornal do Pescador, vol. 26, no. 312, Jan. 1965, printed in Portuguese, single copy 5\$00 (about 20 U. S. cents). Junta Central das Casas dos Pescadores, Rua de S. Bento, 644-4^o Esq., Lisbon, Portugal.:

"Frota nacional da pesca dos crustaceos" (National crustacean fishery fleet), pp. 35-36, illus.

"A lota da praia de peixe em Cascais" (The beach auction of fish at Cascais), pp. 51-52, illus.

"Matosinhos é o mais importante porto sardineiro do mundo" (Matosinhos is the most important sardine port in the world), pp. 39-41, illus.

"O peixe grosso em Cascais é vendido no edificio da lota, em bon e agradável estado" (The large catch at Cascais is sold in the auction house, in a good and agreeable condition), pp. 37-38, illus.

POULTRY NUTRITION:

"Feeding of fish oil and ethyl ester fractions of fish oil to broilers," by Kam C. Leong and others, article, Poultry Science, vol. 43, Sept. 1964, pp. 1235-1240, printed, Poultry Science Association, Kansas State College, Manhattan, Kans.

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QUALITY:

Following articles are from Journal of the Science of Food and Agriculture, vol. 15, 1964. Society of Chemical Industry, 14 Belgrave Sq., London SW1, England.:

"Rapid estimations of hypoxanthine concentrations as indices of the freshness of chill-stored fish," by N. R. Jones and others, pp. 763-774.

"Rapid measures of nucleotide dephosphorylation in iced fish muscle. Their value as indices of freshness and of inosine 5'-monophosphate (IMP) concentration," by N. R. Jones and J. Murray, pp. 684-690.

SALMON:

Déplacements de Saumons Adultes (SALMO SALAR L.) Etiquetés en Gaspésie de 1955 à 1957 (Removal of Adult Salmon--Salmo salar L.--Tagged on the Gaspé Peninsula from 1955 to 1957), by Julien Bergeron and Leon Tremblay, Travaux sur les Pêcheries du Québec No. 3, 17 pp., illus., printed in French, 1964. Bureau des échanges, Station de Biologie Marine, Grande-Rivière, Gaspé-Sud, Quebec, Canada.

1963 Kvichak River Red Salmon Smolt Studies, by Richard A. Marriott, Informational Leaflet 48, 42 pp., illus., processed, March 1, 1965. Department of Fish and Game, Subport Bldg., Juneau, Alaska.

A Report on Fish Disease as a Possible Cause of Pre-Spawning Mortalities of Fraser River Sockeye, by James W. Wood, 27 pp., illus., processed, 1965. International Pacific Salmon Fisheries Commission, P. O. Box 1120, New Westminster, B. C. Canada.

The following articles are from Trudy Dalrybvtus, vol. 3, 1963, printed in Russian. Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khozyaistva, Vladivostok, U.S.S.R.:

"Spawning migration of the Pacific salmon," by I. V. Kizevter, pp. 133-144.

"Variation in the flesh of Pacific salmon by salting and drying," by E. A. Nasedkina, pp. 145-156.

SARDINES:

"Phospholipids of the South African pilchard (Sardina ocellata Jenyns)," by M. H. Silk, article, Journal of the American Oil Chemists' Society, vol. 41, Sept. 1964, pp. 619-622, printed. American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

"The pilchard industry of Cornwall: a review," by M. B. Culley, article, The Fishing News, no. 2692, Jan. 8, 1965, p. 6, illus., printed, single copy 9d. (about 10 U. S. cents). Fishing News, 110 Fleet St., London EC4, England.

The following articles are from Trudy BaltNIRO, vol. 9, 1962, printed in Russian. Baltiiskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii, Kaliningrad, U.S.S.R.:

"Composition of the commercial stock of Sardinella aurita in the Takoradi and Dakar areas," by E. S. Prosvirov and I. I. Osetinskaya, pp. 81-87.

"The South African sardine (Sardinops ocellata)" (biology and fishery), by Yu. A. Komarov, pp. 19-34.

SCALLOPS:

Scallops and the Offshore Fishery of the Maritimes, by N. Bourne, Fisheries Research Board of Canada Bulletin No. 145, 60 pp., illus., printed, C\$1.75. Queen's Printer, Ottawa, Canada.

SCALLOPS AND FLOUNDER:

A Marketing Study of the Scallop & Flounder Industry of New Bedford, Massachusetts, 92 pp., illus., processed, 1965, 35 cents. Area Redevelopment Administration, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) This study was undertaken by the Research Foundation of the New Bedford Institute of Technology in an attempt to assist the sea scallop and flounder fisheries in the depressed area of New Bedford. A test advertising promotion campaign was devised and conducted in representative areas of the United States to determine the effect of such promotion on the consumption of sea scallops and flounder. Results showed that a strong potential for new scallop sales exists in the West Coast area, and that the proper combination of consumer advertising, publicity, and store promotion can substantially increase flounder fillet sales in the northeastern United States. Researchers also found, however, that the New Bedford fishing industry is in serious need of an overall marketing program. Under such a program the industry should form a marketing organization to coordinate research and development with production and management, not merely advertising and promotion. As a food industry, it must develop long-range plans for improving the marketing of its products. Specific recommendations for such improvement include the adoption of a cooperative brand name and better packaging methods and design. In addition, many other considerations must be investigated, such as the establishment of an information clearinghouse, training programs, and a fishing institute. Attention should be given to a continuing study of fish population trends, and to financial, insurance, and employee benefit plans. However, the weakest aspect of the New Bedford fishing industry is the marketing problem, and the researchers urge that active measures be taken to implement the recommendations of this study.

SEALS:

Comparative Feeding Habits of the Fur Seal, Sea Lion and Harbour Seal on the British Columbia Coast, by D. J. Spaulding, Fisheries Research Board of Canada Bulletin No. 146, 52 pp., illus., printed, C\$1.50. Queen's Printer, Ottawa, Canada.

SHARKS:

Sharks and Survival, edited by Perry W. Gilbert, 578 pp., printed, Jan. 1963. American Institute of Biological Sciences, 2000 P St. NW., Washington, D. C.

SMELT:

Smelt Life History and Fishery in the Miramichi River, New Brunswick, by R. A. McKenzie, Fisheries Research Board of Canada Bulletin No. 144, 77 pp., illus., printed, C\$2. Queen's Printer, Ottawa, Canada.

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SMOKING:

"Physical-chemical basis for smoking (fish)," by A. M. Sushko, article, *Trudy Dalrybvvtus*, vol. 3, 1963, pp. 127-131, printed in Russian. *Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti y Khozyaistva*, Vladivostok, U.S.S.R.

SOUNDS IN THE SEA:

Marine Bio-Acoustics (Proceedings of a Symposium held at the Lerner Marine Laboratory, Bimini, Bahamas, April 11 to 13, 1963), edited by William N. Tavolga, 425 pp., illus., printed, 1964, 100s. (\$15 in the United States). A Pergamon Press Book. The Macmillan Company, 60 Fifth Ave., New York, N. Y. 10011. The sea had long been recognized as a silent world, but this illusion was shattered when the development of underwater listening systems and sonar during World War II revealed that many marine creatures emitted sounds or noises. Since the war, underwater sound patterns and their meanings have been studied and analyzed. Many results of the studies in the United States were reported at a symposium held in the Bahamas in April 1963. It was held at the Lerner Marine Laboratory, Bimini, a field station of the American Museum of Natural History, where much pioneering work in the study of underwater sound has been carried out with a unique shore-monitored underwater acoustic-video installation. Also, the Laboratory has a tape library of recorded material of the research in the field which is available to interested scientists. Marine bio-acoustics is a rapidly expanding field of science which embodies the interests and activities of biologists, physicists, mathematicians, acousticians, and other specialists. The symposium brought together several of those disciplines. Many of the sounds coming from the sea are now known to be of biological origin and vary from short bursts of noise to persistent sounds. A considerable amount of noise emanates from such creatures as snapping shrimp and mussels, which both produce significant crackles. Frictional or snapping noises are made by barnacles. Sea urchins make a "frying" noise. On occasions the heavy crackle made by large numbers of Crustacea often makes sonar useless for other purposes in shallow water. Many fish are vocal and the "sonar" equipment of fishes is as varied as are the fishes themselves," according to the book. Sounds are variable, and the possible significances of the greatest number are related to the breeding season. In that case, a large proportion is produced either primarily, or in some instances, exclusively by the males. A chorus of sound often occurs during a particular period each day, such as the summer evening croaker chorus which in California occurs regularly each night soon after sunset for about 90 minutes. Also, it seems evident that certain marine mammals (like whales, porpoises, and dolphins) make considerable use of sound for communication, possibly navigation, and echo-location. But many of the noises heard are still a mystery. The symposium, cosponsored by the Office of Naval Research and the American Museum of Natural History, brought together some 70 specialists from various fields of science, and 22 of the papers presented are correlated in this book. The subsequent discussions are also included. The many topics were covered in five parts: an acoustic-video system for marine biological research (includes papers on requirements, description of the system, use of television); physi-

cal and acoustical aspects (includes such subjects as obtaining bio-acoustic data, processing problems, and types of noises); biological sound producers in the sea; marine fishes as acoustic detectors; and special acoustic problems in cetacean research. Included is a list of attendees and contributors, and both an author and subject index. Although not a book for the general public, it is of particular value to those directly concerned with marine sciences and to others, such as mathematicians and physicists, who are interested in some of the many aspects of marine science.

--Joseph Pileggi

SOUTH ATLANTIC:

"Development of a fishery in the South Atlantic," by S. A. Studenetskii, article, *Trudy BaltNIRO*, vol. 9, 1962, pp. 148-151, printed in Russian. *Baltiiskii Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khozyaistva i Okeanografii*, Kaliningrad, U.S.S.R.

SPAIN:

"Breve analisis de la exportacion Gallega de conservas de pescado en 1963" (Brief Analysis of the Galician export of canned fish in 1963), article, *Industria Conservera*, vol. 30, no. 305, Nov. 1964, pp. 292-294, printed. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

"Otro ano de crecimiento de la produccion pesquera Espanola" (Another year of growth in Spanish fishery production), by Mareiro, article, *Industrias Pesqueras*, vol. 34, no. 905, Jan. 1, 1965, pp. 12-13, printed in Spanish, single copy 40 ptas. (about 70 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2º, Vigo, Spain.

Publicaciones Tecnicas Junta de Estudios de Pesca (Technical Publications of the Fishery Research Committee), no. 4, 1965, 409 pp., illus., printed in Spanish. Direccion General de Pesca Maritima, Subsecretaria de la Marina Mercante, Ministerio de Comercio, Madrid, Spain. Contains, among others, these articles: "Las merluzas Atlanticas" (The Atlantic hakes), by Fernando Lozano Cabo; "La pesqueria de arrastre de Castellón, en ejemplo de sobrepesca" (The trawl fishery of Castellón, an example of overfishing), by Manuel Gomez Larraneta; "Evolución de los rendimientos al finalizar el tercer año del plan experimental de pesca de arrastre" (Development of the effort to finalize the third year of the experimental trawl fishing plan), by P. Suau; "Evolucion de los costos y beneficios de la flota de arrastre de San Carlos de la Rápita, perteneciente al plan experimental de pesca de arrastre en 1963" (Change in the costs and profits of the trawler fleet of San Carlos de la Rápita pertaining to the experimental trawl fishing plan in 1963), by Luis Millan Roca; "Nuevos pesqueros que entran en servicio" (New fishing vessels which went into service); "La campaña del Walther Herwig en aguas de Africa occidental" (The cruise of the Walther Herwig in West African waters), by Miguel Massuti; "Sobre las fluctuaciones de la produccion de atunes de las almadrabas sudatlánticas" (On the fluctuations in tuna production in the South Atlantic tuna fisheries), by Julio Rodriguez-Roda; "Las algas de interes industrial de la costa de Cadiz" (The seaweeds of commercial interest on the Cadiz coast), by Juan Seoane Cambra; "Campaña a bordo de un bacaladero" (Cruise on board a cod fishing vessel), by Orestes Cendredo; "Perspectivas de la majora de la

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pesca de arrastre de Valencia" (Prospects of improvement in the trawl fishery of Valencia), by J. M. San Feliu; "Estudios sobre la pesca de arrastre en la Provincia de Tarragona" (Studies on the trawl fishery in the Province of Tarragona), by F. Vives Galmes; and "Evolucion de la produccion pesquera Española" (Changes in the Spanish fishery production), by Antonio Franco and Julian Sanchez-Ramos. Also includes articles on: "Estudios de la gamba rosada o carabinero (*Aristeus antennatus*)" (Studies on the red shrimp--*Aristeus antennatus*), by C. Bas; "Plan de estudios sobre la pesca de arrastre en general y la de langostinos y acedias en particular, en la region Sudatlantica Andaluza" (Plan for studies on the trawler fishery in general and that of spiny lobsters and yellow soles in particular, in the South Atlantic area of Andaluz), by F. Lozano Cabo; "Estudio sobre las algas de aprovechamiento industrial de la Provincia de Santander" (Study on the seaweeds for industrial development in the Province of Santander), by F. Ramos and O. Cendrero; "Las algas del Noroeste de España" (The seaweeds of Northwest Spain) by J. Seoane; "Programa de recuperacion ostricola en el Bao (Ria de Arosa)" (Program for renewal of oyster culture in El Bao--Arosa Estuary), by B. Andreu; "Plan de estudio de las pesquerias de arrastre de Baleares" (Plan for study of the trawl fisheries of the Balearics), by M. Oliver and M. Massuti; "Plan de trabajos sobre los escombros Atlanticos-Africanos" (Plan for research on the African Atlantic mackerels), by F. Lozano; "Re poblacion ostricola en el Cantabrico" (Renewal of oyster culture in Cantabria), by J. Cuesta; "Actividades internacionales de la Direccion General de Pesca Maritima" (International activities of the Office of Marine Fisheries), by O. Rodriguez Martin; "La tecnica pesquera del futuro" (The fishery technique of the future), by Trad. J. Barcelo; and "Trabajos tecnicos de la O.E.C.D." (Technical works of the O.E.C.D.).

SPAIN AND NORWAY:

"Aktuelle betraktninger omkring fiskeriene i Spania og Norge" (Current views about fisheries in Spain and Norway), by B. Løvås-Svendsen, *Tidsskrift for Hermetikindustri*, vol. 51, no. 1, Jan. 1965, pp. 21-22, printed in Norwegian. Norske Hermetikfabrikers Landsforening, Stavanger, Norway.

SPERM OIL:

The following are from Chemical Abstracts, vol. 59, American Chemical Society, 1155 16th St. NW., Washington, D. C. 20006:

"Technology of sperm oils," by N. A. Nikonova and V. E. Kulyasova, Dec. 9, 1963, Abstract No. 14227g.

"Treatment of sperm whale oil," by Hisashi Fujii, Mikio Hori, and Takeo Horii, Nov. 11, 1963, Abstract No. 11768e.

"Treatment of sperm whale oil," by Saburo Yoritachi and Koretsu Wo, Nov. 11, 1963, Abstract No. 11768d.

SPINY LOBSTER:

"Une campagne trop longue, mais des resultats positifs--Telle est la premiere leçon de la campagne du langoustier Rigel, de Douarnenez, au Honduras" (A cruise too long but with practical results--such is the primary conclusion of the cruise of the spiny

lobster vessel Rigel from Douarnenez to Honduras), article, *La Pêche Maritime*, vol. 44, no. 1043, Feb. 1965, pp. 77-81, 82, illus., printed in French, single copy 14 F (about US\$2.85). *La Pêche Maritime*, 190, Blvd. Haussmann, Paris, France.

"La langosta" (The spiny lobster), by Lorenzo Marques, article, *Iberica*, vol. 42, no. 30, Dec. 1964, pp. 394-396, 397, illus., printed in Spanish. *Iberica*, Palau, 3, Apartado 759, Barcelona-2, Spain.

STURGEON:

From the series: *Travaux sur les Pêcheries du Québec*, illus., printed in French, 1964. Bureau des échanges, Station de Biologie Marine, Grande-Rivière, Gaspé-Sud, Québec, Canada.

Étude Préliminaire de l'Esturgeon de Lac, ACIPENSER FULVESCENS, dans la Région de l'Abitibi (Preliminary Study of the Lake Sturgeon, *Acipenser fulvescens*, in the Abitibi Region), by Gerard Deaulieu and Etienne Corbeil, No. 4, 8 pp.

Validite d'une Distinction Specifique entre les Deux Acipenserides: Acipenser Sturio L. d'Europe et Acipenser OXYRHYNCHUS d'Amerique du Nord (Validity of a Specific Distinction Between the Two Acipenseridae: *Acipenser sturio* L. of Europe and *Acipenser oxyrhynchus* of North America), by Etienne Magnin, No. 1, 20 pp.

SWEDEN:

"Det Svenska havsfisket ökade under år 1964" (The Swedish marine fisheries increase during the year 1964), article, *Svenska Västskustfiskaren*, vol. 35, no. 4, Feb. 25, 1965, pp. 76-77, illus., printed in Swedish, single copy 10 kr. (about US\$1.95). Svenska Västskustfiskarnas Centralförbund, Ekonomiskottet Postbox 1014, Göteborg 4, Sweden.

TRADE LISTS:

The U. S. Department of Commerce has published the following mimeographed trade list. Copies may be obtained by firms in the United States from the Commercial Intelligence Division, Office of International Trade Promotion, Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. 20230, or from Department of Commerce field offices at \$1 each.

Canneries and Frozen Foods--Producers and Exporters--Greece, 12 pp., Feb. 1965. Lists the names and addresses, size of firms, and types of products (including fish and shellfish) handled by each firm. Also contains trade and industry data (including fishery products) on production, exports, imports and import control of canned and frozen foods.

TRAWLING:

Preliminary Bibliography on Trawlers and Trawling with Particular Reference to Tropical Waters, compiled by A. Soulier, Occasional Paper 64/4 (Addendum 1), 8 pp., processed, Jan. 1965. Indo-Pacific Fisheries Council, Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

TUNA:

"Purse seine for tuna fishing," by V. S. Dolbish, article, *Trudy Dalrybvtus*, vol. 3, 1963, pp. 41-52, printed

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

in Russian, Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khoziaistva, Vladivostok, U.S.S.R.

TUNA AND TUNA-LIKE:

Tuntsy i Mecheobraznye Tikhogo i Indiiskogo Okeanov (Tunas and Billfishes of the Pacific and Indian Oceans), by V. G. Osipov, I. V. Kizevter, and A. V. Zhuravlev. 74 pp., illus., printed in Russian, 1964, 23 Kop. (about 25 U. S. cents). Pishchevaia Promyshlennost', Moscow, U.S.S.R. The first chapter is devoted to a review of the biology of tuna and billfish. A section on the tuna fishery covers reconnaissance; features of the fishery--bait, purse-seine, and long-line fisheries; characteristics of foreign vessels--tuna motherships with catcher boats; fishing gear; and machinery and equipment. The final section includes information on processing technology for tuna, and other aspects of the tuna fishery--tuna, billfish, yellowtail (amberjack), barracuda, bonito, mackerel, dolphin fish, sharks and rays, processing of the catch aboard vessels, and canning of tuna. Most of the sections are based on older literature. Even though this book was published in April 1964, in general it draws on much older publications and data than one would expect from the date of publication. Although the authors draw on information from non-Russian literature, some information on the Russian tuna fishery is included. The book appears to be concentrating on long-lining for tuna, which most likely reflects the fact that the U.S.S.R. seems to be especially interested in that type of fishery. The Kaliningrad-type line hauler mentioned in the book could be of interest to gear technologists. The section dealing with processing technology is perhaps most noteworthy. It contains many data on the various tuna and other fish which were obtained by the investigators of TINRO (Pacific Scientific Research Institute of Marine Fishery and Oceanography). The section contains, among other items, information on: (1) weight-length relationship; (2) relation of the various parts of the body to the total weight; (3) data on the content of moisture, oil, protein, and ash for various fish and various body parts; (4) amino acid composition; (5) physical-chemical properties of the oil; (6) vitamins; and (7) mineral components.

--W. L. Klawe, Inter-American Tropical Tuna Commission

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 13, no. 2, Feb. 1965, 32 pp., printed in Turkish. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, "The role of fish in animal feeding and nutritional contributions of fish products. Part II," by Macide Akgunes; "Technological developments in the field of fish flour. Part III," by Hikmet Akgunes; and "General Fisheries Council for the Mediterranean. Part I," by Sadan Barlas.

UNITED KINGDOM:

The following Command Papers of the British Parliament, Session 1964-65, are available from the British Information Services, 845 Third Ave., New York, N. Y. 10022.:

Agreement between the Government of the United Kingdom of Great Britain and Northern Ireland and

the Government of the Kingdom of Norway for the Continuance of Fishing by Norwegian Vessels within the Fishery Limits of the United Kingdom of Great Britain and Northern Ireland, London, Sept. 28, 1964, (with Exchanges of Notes), (Ratifications Have Not Been Exchanged), Norway No. 2 (1964), Cmnd. 2505, printed, 1s. (20 U. S. cents when ordered in the United States).

Exchange of Notes between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the Polish People's Republic regarding the Rights to be Accorded to Polish Vessels within the British Fishery Limits to be Established on Sept. 30, 1964, Warsaw, Sept. 26, 1964 (The Agreement entered into force on Sept. 30, 1964), Treaty Series No. 64 (1964), Cmnd. 2507, printed, 1s. (20 U. S. cents when ordered in the United States).

Exchange of Notes between the Government of the United Kingdom of Great Britain and Northern Ireland and the Government of the Union of Soviet Socialist Republics on Matters Arising from the Establishment by the United Kingdom of the Fishery Regime Provided for by the Fishery Limits Act, 1964, Moscow, Sept. 30, 1964 (The Agreement entered into force on Sept. 30, 1964), Treaty Series No. 63 (1964), Cmnd. 2506, printed, 1s. (20 U. S. cents when ordered in the United States).

Protocol of Provisional Application of the Fisheries Convention and Two Agreements as to Transitional Rights Open for Signature at London from March 9-April 10, 1964, London, March 9, 1964 (The Protocol and Agreements entered into force on March 9-April 10, 1964), Treaty Series No. 60 (1964), Cmnd. 2495, printed, 1s. 3d. (30 U. S. cents when ordered in the United States).

U.S.S.R.:

Sovetskie Rybokhoziaistvennye Issledovaniia v Moriaxh Evropeiskogo Severa (Soviet Fisheries Investigations in North European Seas), 468 pp., illus., printed in Russian with English summaries, 1960, Vsesoiuznyi Nauchno-Issledovatel'skii Institut Morskogo Rybnogo Khoziaistva i Okeanografii, Moscow, U.S.S.R. Contains, among others, these articles: "Some results of oceanographic investigations in the Norwegian and Greenland Seas," by A. P. Alekseev and B. V. Istoshin; "Oceanographic characteristics of the North Greenland Sea," by A. F. Laktionov, V. A. Shamontyev, and A. V. Yanes; "On the effect of some oceanographic characteristics on herring migration in the Norwegian Sea," by S. I. Potaichuk; "Changes in the Barents Sea bottom fauna under the influence of fluctuations in the hydrological regime," by K. N. Nesis; "Zooplankton of the frontal zone in the North Atlantic in the spring of 1958," by A. P. Kusmorskaya; "Main regularities in the plankton development in the Norwegian and Greenland Seas," by E. A. Pavshitski; "The distribution of plankton along the 30° W. meridian in the Atlantic, April-May 1959," by I. P. Kanaeva; "Biological peculiarities in some groups of the Barents Sea cod," by E. M. Mankevich; "The results of young cod and haddock surveys in the Barents Sea in the period 1946-1959," by A. S. Baranenkova; "Main stages in the Soviet studies of the redfish in the North Atlantic," by V. A. Borodatov and V. I. Travin; "A note on local redfish stocks in the Newfoundland and Labrador areas," by K. P. Ya-

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nulov; "The distribution and migrations of immature and young mature Atlanto-Scandian herring," by S. S. Fedorov; "Peculiarities in distribution, growth and maturation of some herring year-classes in the Barents Sea," by I. V. Shutova-Korzh; "Distribution of herring of the Atlanto-Scandian stock," by I. G. Fridland; "On methods of scouting for herring in the Northern Seas," by A. A. Baral; "On estimation of the Atlanto-Scandian herring stock," by Ju. Ju. Marty, S. S. Fedorov, and I. G. Yudanov; "Fisheries investigations in the Middle Atlantic," by A. N. Probatov, E. S. Prosvirov, and O. G. Ryabikov; "On the stocks of main food fishes in the Southern and South-eastern Baltic Sea," by N. P. Birukov, G. I. Tokareva, and A. V. Seletskaya; "Fishery investigations in the White Sea," by N. A. Dmitriev; "Some results of investigations on biology of salmon (*Salmo salar* L.) of the Kola Peninsula Rivers," by V. V. Azbelev and I. I. Lagunov; "Main peculiarities in the annual life cycle of the White Sea population of Greenland seals," by S. V. Dorofeev; "Observations on fish behaviour by means of underwater technique in the Barents Sea," by O. N. Kiselev; and "The use of submarines for fishery research," by V. P. Zaitsev and D. V. Radakov.

"URSS--transformation et commercialisation du poisson" (U.S.S.R.--Processing and commercial development of fish), by Carlo Lozzi, article, *France Pêche*, no. 91, Jan. 1965, pp. 39-40, 49, illus., printed in French, single copy 2.50 F (about 50 U. S. cents). *France Pêche*, Boite Postale 179, Lorient, France.

The following articles are from *Trudy Dalrybvtus*, vol. 3, 1963, printed in Russian, Dal'nevostochnogo

Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khozyaistva, Vladivostok, U.S.S.R.:

"The fishing industry of Kamchatka," by V. S. Gorelik, article, pp. 5-17.

"Increase in the transport capacity of the East refrigerated fishing fleet (Vostokrybkhoolodflot)," by Sh. G. Nadiboidze, pp. 18-28.

WHALE MEAT:

"Determination of the quality of whale meat," by L. P. Shmelkova and N. A. Nikonova, article, *Trudy Dalrybvtus*, vol. 3, 1963, pp. 173-176, printed in Russian, Dal'nevostochnogo Tekhnicheskogo Instituta Rybnoi Promyshlennosti i Khozyaistva, Vladivostok, U.S.S.R.

WHALING:

"The Antarctic baleen whale stocks," article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 54, no. 1, Jan. 1965, pp. 1-3, printed. Hvalfangforeningen, Sandefjord, Norway.

WHITING:

Extension d'Aire du Merlu, *MERLUCCIUS BILINEARIS* (Mitchill) en Amérique du Nord (Extension of the area for whiting, *Merluccius bilinearis* Mitchill, in North America), by Gerard Beaulieu and Etienne Corbeil, *Travaux sur les Pêcheries du Québec* No. 5, 7 pp., illus., printed, 1964. Bureau des échanges, Station de Biologie Marine, Grande-Rivière, Gaspé-Sud, Quebec, Canada.



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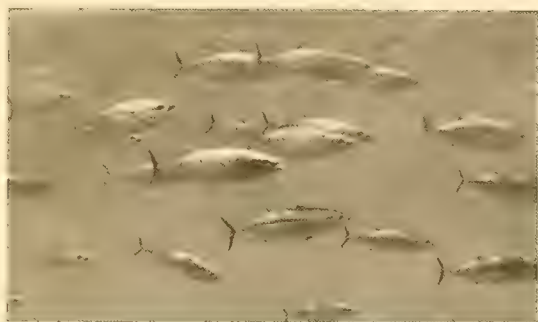
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HIGHLIGHTS IN THIS ISSUE (JUNE 1965)



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Underwater photo of skipjack tuna.

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